IRON AND COAL
TRADES REVIEW

Vol. 181 November 25, 1960 No. 4,819

Autumn Review

THE Treasury, in its latest review, sums up the economic situation today in three sentences: Total industrial output has levelled. with increases and decreases cancelling out. The pressure of demand for labour has not eased. The growth of inflationary pressure has been checked; but the trend in costs is upward and the external position is not yet satisfactory.

And the prime need called for by the economic situation as it is seen by the Treasury in the autumn of 1960? An intensified export drive!

British manufacturers can perhaps be excused if they reply that "this is where we came in." The earlier post-war exhortation to "export or die" gave way only recently to the less urgent slogan "export for fun." Now we are being told once more that as a nation we must export in order to live.

This all too self-evident truth bears repetition. Industrialists know well enough that the Treasury is not crying "Wolf!" The general public is not so convinced, judging from its reaction to the official warnings which are uttered from time to time. To sell abroad manufacturers have to produce goods of the right quality and at the right price, and deliver them as promised. Yet all too often when they modernize their plant or reorganize production methods to bring their costs into line they are confronted by a dog-in-the-manger attitude by the trade unions which insist on the same number of men being employed on a particular operation no matter what mechanical aids have been provided. The latest instance of this kind is reported this week by a manufacturer who, having put in a machine which will do the work of six men, has been told that six men must still be employed to operate it. Once goods are made and despatched to the ports they may be held up for weeks by a dock strike. Now, it appears, engineering employers have to face a greatly increased overall wage cost which is bound to affect their competitive position unless costs can be reduced in other directions. Somehow, the workers on the shop floor and their union representatives have to be convinced that they cannot have it both ways. Either the wage content of manufacturing costs must be kept constant by higher productivity, or the cost of the article made must go up, with all the effect on sales which that may have.

The Treasury warns about this very thing. The main threat to the economy is still insufficient oversea earnings, it says. An intensified export drive is called for, especially since less buoyant world demand makes the export task difficult. It will become still more difficult if there is a general return in this country to increased costs and prices.

The Conversation Turned To . . .

EXCHANGE of ideas is, of course, one of the main reasons for holding a conference of technical people, and the sessions will inevitably stir the mind and perhaps the imagination, too. It would be an unrewarding meeting unless they did. Of almost equal value, however, can be the chance discussions that arise from time to time during a conference period, perhaps at a works visit or, maybe, over a meal. This applies with equal force to meetings abroad, particularly if they have a strong international character, because the inherently different approaches of various nationalities even to the same problem are an added stimulus to discussion.

Some 25 countries were represented at the 100th anniversary meeting of the German Iron and Steel Institute, a report of which is on page 1151 of this issue, and here certainly the conversation wandered into many channels. Thus, for instance, during a lunch someone began sketching a conventional blast-furnace hoist on the menu card and then a belt conveying system, which, it was suggested, would feed the furnace just as efficiently and at lower capital cost. The claim was not that it was a new idea, but that the method of putting it into effect was new and would make it quite practicable for a modern plant.

At another of these quite spontaneous technical discussions it transpired that someone was examining the possibility of producing low-hydrogen steel by washing the molten bath with argon. A Japanese scientist was said to be working on these lines and a Czech worker to have already achieved hydrogen values comparable with those obtained by vacuum stream degassing of steel.

Many of the ideas put forward in these chance discussions might sound somewhat impracticable, but then so must some of the new processes operating today, such as the modern strip mill, when first mooted some 160 years ago. Enlightened in-

dustrial policy sets aside ample funds and manpower for research and development, but unless ideas are forthcoming the results are poor. Sources of ideas are to be treasured and when ideas come, no matter from what source, they must be seized upon and carefully examined, however impracticable they may seem at first sight.

Iron and Steel Price Changes

PRICES of some specifications of iron and steel products will be increased on Monday, November 28, while others will be reduced; the greater number of prices remains unchanged. Certain extras and allowances have been revised.

The changes include increases in the maximum prices of high-phosphorus foundry pig-iron (11s. up), of certain specifications of hot finished tubes (806 class B 4½ in. up £4) and non-alloy bright bars (soft basic up 26s. 6d.), and reductions in alloy bars (EN 10 black bars down 10s.), stainless steel, cold-rolled strip, and forging quality billets.

Overall, the changes made do not represent any increase in the general level of iron and steel prices, nor do they represent any significant reduction. This confirms the forecast made in the board's announcement last month concerning the effect on iron and steel prices of the recent rise in coal and coke prices.

Engineers Consider Next Moves on Wage Demands

NEXT step on the engineering unions' wage claim is likely to be taken at York on December 8, when the Confederation of Shipbuilding and Engineering Unions is to hold a conference of executives of its affiliates. This follows the rejection, on Wednesday, of the employers' offer of increases ranging from 5s. 6d. to 7s. a week. The unions had asked for £1.

The reply of the Shipbuilding Employers' Federation (which was confronted with a similar demand) was given yesterday (Thursday) and the unions concerned are likely to seek a new offer before making a further move.

Mr. John Rannie, president of the federation, pointed out that the size and value of the industry's order-book continued to decline. The position was a serious one, he said. Any advance in wages now would inevitably accentuate shipbuilders' difficulties in competing with continental firms.

Austrian Rails for Switzerland

ALPINE Montangesellschaft (Austria) has signed a contract to supply to Switzerland 10.000 metric tons of railway rails over the next financial year.

Since the end of the war, the company has sold a total of 100,000 metric tons of rails to Switzerland.

A GRANT OF more than £15,000 was made to Sheffield University by the Department of Scientific and Industrial Research. The gift, spread over three years, is for research on training problems, with particular reference to industrial skills, and is to be undertaken by Prof. H. Kay of the Department of Psychology.

Passing Thoughts . . .

WORK must not be seen as something to be reduced in order to achieve greater efficiency in production, but as something absolutely necessary to man as a justification for his existence. Without work he will rot, spiritually and mentally. I would dare to suggest that the problem is so to order and discipline technical advance that there will be adequate work for everybody . . . there needs to be a much clearer sense of purpose behind our scientific progression.—VEN. ERIC TREACY, Archdeacon of Halifax, at the annual dinner of the North Midland Centre of the Institution of Electrical Engineers.

> *We are getting very near the point of accepting unofficial strikes as a habit which cannot be shaken off. . . . You just cannot measure by statistics the damage done by unofficial strikes.*—COL. W. L. DENHOLM, *vice-chairman of the Shipping Federation.*

Let the unions retain the freedom to perform their legitimate functions, but let them be deprived of the freedom to bring hardship to individual employees or unjustifiable dislocation to the national economy. If the Government did move in this way, I believe it would have the backing of a large number of trade unionists who are so often made to suffer by the antics of a few subversive elements in their midst.—SIR HALFORD REDDISH, chairman and managing director of the Rugby Portland Cement Company, Limited.

> *The right to withhold labour is a liberty, but a liberty that must not be abused.*—DR. GEOFFREY ALLEN, *Bishop of Derby.*

On urgent matters of industrial disagreement it seems to me that in the engineering industry, and other industries, there is room for the introduction of some form of local arbitration on a voluntary basis. We should not then be so dependent on the submission of local differences to national machinery which often leads to frustration.—MR. J. L. JONES, Midland regional secretary, Transport and General Workers Union.

> *We are living longer than ever before, so where does the danger from our coal fires come in? We old ones are sick of being ordered how to live out the rest of our time. We like our coal fires and and always will. All we want is peace.—Letter in Bradford Telegraph and Argus.*

REDUCTION IN SOUTH DURHAM'S PROFIT

RESULTS of the South Durham Steel & Iron Company, Limited, for the year to October 1, 1960, show that the profit balance, before tax, fell from £5,292,885 to £4,482,706. The dividend is maintained at 12 per cent. with a final of 8 per cent.

Trading profits were higher at £8,066,717, compared with £7,847,094, but depreciation and interest charges were substantially heavier in the past year. After tax, including transfer to investment allowances reserve, the balance of £2,232,706 compares with £2,692,885. Net cost of the dividend total, which is on capital increased by debenture and loan conversions, is £1,010,908, against £686,000.

THE 100-YEAR-OLD Italian steelmakers, S. & A. Eredi Gnutti has announced the erection of a new tube plant at Lumezzane, near Brescia.

Sale of Steel Securities

ANOTHER STEP TOWARDS FULL DENATIONALIZATION

TREASURY consent has been given for the Iron and Steel Holding and Realization Agency to sell to the Whitehead Iron & Steel Company, Limited, Newport (Mon), its remaining holding of stock (nominal value £1,050,000) at a price of £80 per £100 of stock, plus accrued interest. The purchase price of £840,000 is to be paid on completion. ISHRA sold the ordinary shares to the company in February, 1955. The redemption of the last securities of Whitehead still held by ISHRA marks the start of the agency's sale of the fixed interest securities of those steel companies which have already been denationalized. The total market value of such securities is about £120,000,000.

The price of £80 per cent. corresponds to a yield to final redemption of the stock (February 1, 1985) of just under 6.1 per cent. Originally £1,250,000 4½ per cent. stock, 1970-85 was issued, but £200,000 has already been redeemed.

The redemption of all this stock for a total of £1,040,000, together with cash receipts of £500,000, and the £3,437,500 for which the ordinary share capital was sold to the public on denationalization, has brought the agency £4,977,500 as proceeds for the disinvesting of Whitehead. This compares with £4,843,447 paid in compensation for Whitehead when the company was originally nationalized.

Investigation of Trade Union Law Called For

THE time has come for the Government to set up an independent and impartial committee to consider the whole law relating to trade unions, Sir Halford Reddish, chairman and managing director of the Rugby Portland Cement Company, Limited, and a member of the national council of the Institute of Directors, said at a luncheon organized by the institute in Glasgow on Thursday of last week.

No one disputed the right of employees to withdraw their labour in a constitutional manner in furtherance of an industrial dispute with their employer, but this freedom was never intended for use in matters unconnected with a dispute between employer and employee, he said. Strikes over inter-union disputes, and over disagreements between a union and one of its members were contrary to the intention of the Act which legalized trade unions. "The so-called sympathetic strike," he said, "in effect holds the community at ransom and attempts to usurp the function of elected Government."

MR. F. E. VERNALS, a director of G. E. Simm (Machinery), Limited, Sheffield, has been elected to the council of the British Association of Machine Tool Merchants. He has been a co-opted member of the council for more than three years and has served as secretary of the association's northern area group. Mr. A. KISSACK, a director of Thos. W. Ward, Limited, was also elected to the council and a fellow director, Mr. H. VERNON, was appointed a Fellow of the association.

F. C. Lea Laboratory at Sheffield University

MEMORIAL plaque to the late Prof. Frederick Charles Lea was unveiled at a laboratory in Sheffield University last Friday by Mr. W. H. Higginbotham, chairman of Edgar Allen & Company, Limited, on the board of which Prof. Lea served after his retirement from the university. The laboratory will be known as the F. C. Lea laboratory and will be devoted to the study of the strength of materials.

Prof. Lea, formerly Professor of Mechanical Engineering at Sheffield from 1923 to 1936 and a former president of the Institution of Mechanical Engineers (1943), was an early investigator of creep and fatigue, and a keen protagonist of the analytical approach to engineering problems. He was Dean of the Faculty of Engineering at the university for 12 years and died in 1952 at the age of 81.

A grant of more than £15,000 has been made to the university by the Department of Scientific and Industrial Research. The gift, spread over three years, is for research on training problems, with particular reference to industrial skills, which is to be undertaken by Prof. H. Kay, of the Department of Psychology.

Distington's Iron Foundry Breaks Another Record

FOR the fourth time in less than 12 months, Distington Engineering Company, Limited, a branch of the United Steel Companies, Limited, announces a new British and European ingot mould foundry output record. During the week ended November 4, 2,810 tons of ingot moulds, bottom plates, slag ladles, and general engineering castings were produced, beating the previous record, set up in May, by over 100 tons.

This steadily rising level of output is keeping pace with the increasing demand for Distington's products, and the favourable trend is expected to continue.

PROF. R. DURRER, of Zurich, Switzerland, has, together with Mr. R. LELLEP, of the US, been presented with the Carl Lueg Memorial Medal for services to the development of iron processing technique by the German body Verein Deutscher Eisenhüttenleute.

Appointments

Works Manager for Skefko's New Factory

THE appointment is announced of Mr. A. I. Helm, plant engineer, as works manager of the proposed new factory at Irvine (Ayrshire) of Skefko Ball Bearing Company, Limited, Luton. Mr. Helm has been plant engineer at Skefko for nearly 25 years and during that time has been mainly responsible for all the company's buildings and extensions as well as plant and maintenance.

MR. A. I. HELM

On leaving school, he joined Clarke, Chapman & Company, Limited, as a pupil apprentice, and later worked for a period in the drawing office of the Mitchell Conveyor Company, Limited. He is a member of the Institute of Marine Engineers and the Institution of Plant Engineers, and a representative member of the British Institute of Management.

Mr. K. G. SMITH has been appointed investment manager of the pension fund of the General Electric Company, Limited.

The U.A.M. Group, Limited, manufacturers of asbestos cement goods, etc., has appointed Mr. W. SYLVESTER to its Birmingham sales area.

Mr. H. L. MCLEOD, chief accountant of the Maestro Welding & Engineering Company, Limited, London, has been appointed secretary of the company.

Mr. C. G. LLOYD, formerly sales office manager of Steel Fabricators (Cardiff), Limited, has been appointed sales manager of the company's agricultural and industrial sales divisions.

Mr. T. H. B. LAWTHER has been appointed technical representative for the mining plant division of F. Taylor & Sons (Manchester), Limited, a member of the Steel & Company, Limited, group.

Mr. ROWLAND BARKER has been appointed as representative for the West Riding of Yorkshire and Derbyshire for C. Akrill, Limited, Crewe, Thomas Perry, Limited, Bilston, and Midland Rollmakers, Limited, Crewe.

Following the retirement of Mr. A. V. Hichisson at the end of October, Mr. J. HOUNSELL, assistant publicity manager, has been appointed publicity manager of Westinghouse Brake & Signal Company, Limited. Mr. A. A. RHODES has been appointed deputy publicity manager.

Mr. C. H. EBORALL, at present representative in North America and the Caribbean area of the Export Credit Guarantee Department, is to join the English Electric Company, Limited, when he relinquishes this post. The new appointment will take effect from April 1, 1961.

Mr. R. H. KING, who has been manager of the Wisbech (Cambs) factory of the Metal Box Company, Limited, for the past four years, has been appointed to a new post at the company's Acton (Middx) works. He is succeeded by Mr. W. R. DOUGHTY, formerly manager of the Portadown (Co. Armagh) factory.

Keelavite Hydraulics, Limited, manufacturers of hydraulic power and control equipment, of Allesley, Coventry, has appointed Mr. T. P. KEELING as its European representative. After a number of years in various departments of the company in England, Mr. Keeling spent several months in Australia and the US to assess markets and business methods. He will be based at the company's office at Pieter de Hoochstraat 17B, Rotterdam 6, Holland.

Pit House Colliery Reorganization

REORGANIZATION of Pit House Colliery (Co. Durham) to a modern coal-producing unit is not yet complete, but, states the Durham Divisional Coal Board, satisfactory results are already emerging. In 1957 daily output was some 1,400 tons; now it is 2,200 tons. Manpower has been built up from 1,050 to 1,300 and output per manshift has reached 27.5 cwt., a record for the pit.

In the past two years a drift, ¼-mile long with a one-in-four gradient, has been driven from the surface and coal, instead of being wound up the shaft, is now moved on the factory conveyor belt system from face to pithead. Of the output 45 per cent. is power loaded. The remainder is shovelled on to the conveyors by fillers, but the coal is not manhandled again until after it leaves the modern washery, cleaned and prepared for the customer.

Most of the coal is won from seams less than 2-ft. thick and a plough operating in the Tilley Seam, which is 3-ft. thick, is producing about 550 tons a shift.

The reconstruction will include a new ventilation system which will be introduced during 1961.

Conservative Coal Criticisms Countered

CRITICISMS of coal price increases were countered by the Minister of Power, Mr. Richard Wood, at a private meeting of the Conservative Power Committee on Wednesday. It is understood that Mr. Wood pointed out that the alternative to the increases could only have been an Exchequer subsidy for the National Coal Board and that would not have been in the public interest.

One of the board's main financial problems had been coal stocks and it was originally estimated that during 1960 stocks would fall by 1,000,000 tons. Present indications, however, were that the fall would not be less than 5,000,000 tons.

The suggestion that more coal could be sold if prices were lowered was put forward, but Mr. Wood doubted if this would follow. He believed coal was bound to meet increasing competition from oil, whatever happened.

PROTESTS MADE last week in Coalville (Leics) regarding the introduction of oil-fired heating in place of solid fuel boilers at the two biggest working men's clubs there, have resulted in boycott action being urged by the Leicestershire Area Council of the NUM.

In Parliament

HOW ISHRA STANDS

Mr. Nabarro Wants Speedier Steel Denationalization

WARNING that because the Economic Secretary to the Treasury, Mr. Anthony Barber, had given him "a very unsatisfactory reply" he would raise the matter on the Adjournment, was given by MR. GERALD NABARRO (Con.) in the House on Thursday last. He had asked for full details of the aggregate sum of State investment by the Iron and Steel Holding and Realisation Agency in nationalized and private sectors of the steel industry combined and how it compared with the £252,000,000 when steel denationalization began in 1952.

MR. BARBER said that £252,000,000 represented the agency's holding of securities in its subsidiary companies on July 13, 1953, the date on which it succeeded the Iron and Steel Corporation. At that date there were also loans outstanding to subsidiary companies of £57,000,000 and obligations as guarantor of £55,000,000, making a total of investments and obligations of £364,000,000.

The comparable figure at September 30, 1960, was £199,000,000 comprising £154,000,000 of investments in all classes of securities in companies both public and private, £32,000,000 loans outstanding, and £13,000,000 obligations.

Inadequate Progress

This rate of progress was wholly inadequate, said MR. NABARRO. The moment was propitious to speed up denationalization, notably with the equities still held by ISHRA. Would the Chancellor now fix an early date for the denationalization of Richard Thomas & Baldwins, Limited?

When one took into account the fact that the industry had grown considerably in size since 1953, ISHRA had a much smaller share of a much larger industry, MR. BARBER replied. He reminded Mr. Nabarro that the work of the agency was to be substantially completed in the lifetime of this Government.

Mr. Barber knew very well that he could not and would not denationalize RTB for a considerable time ahead. The taxpayer had already lost a very substantial sum of money through the Government in the past denationalizing steel firms, said MR. HAROLD WILSON (Lab.).

MR. C. OSBORNE (Con.) asked why the Chancellor had consented to the immediate issue by ISHRA of its fixed interest bearing stocks to the public while the Bank rate was 5½ per cent. instead of waiting for a lower Bank rate when higher prices would be obtainable.

In a written reply MR. BARBER stated that so long as the Government was a long-term borrower it had to pay the prevailing rate for money.

COAL BY ROAD

SPECIAL arrangements were being made by the British Transport Commission and the National Coal Board to ensure the adequate distribution of coal and some traffic was being diverted to the roads. This reply was given by MR. RICHARD WOOD, Minister of Power, in reply to a question by MR. NORMAN DODDS (Lab. and Co-op.) and MR. WILL OWEN (Lab. and Co-op.).

The two industries were in constant touch, he went on, and British Railways was now moving about 200,000 tons of coal a week more than last year. Deliveries to the London area in October had made possible a very large increase in the amount of coal delivered to consumers and in the amount merchants could add to their stocks. Road transport of considerable coal supplies for power stations would free facilities for the movement of other coal.

Referring to the shortage of large house coal, MR. PERCY BROWNE (Con.) said that it was ridiculous that the industry should be contracted because it was producing too much of an unwanted commodity and not enough of a commodity which was required.

The Minister said that steps were being taken to produce more large coal and the situation would be no more difficult this year than in previous years.

NO BARGAIN PRICES FOR COAL

WHEN MR. JAMES WATTS (Con.) suggested that the National Coal Board should refrain from further price increases while surplus stocks existed, MR. RICHARD WOOD, Minister of Power, replied that the board's prices must continue to depend on its financial position.

MR. WATTS went on to suggest that when a trading concern had surplus stocks, lower and not increased prices would sell them. The recent increase in price had not only caused hardship but had priced coal out of the market in favour of fuel oil.

MR. WOOD could not agree. If the board had reduced the price of coal in stock it would have had the effect that any extra coal bought from stocks would have been replaced from current production. The effect on the stock position would not, therefore, have been very great.

DISTRIBUTED COAL STOCKS

REPLYING to Mr. Will Owen (Lab. and Co-op.), MR. JOHN C. GEORGE, Parliamentary Secretary to the Ministry of Power, said that distributed stocks of coal on November 5 were 15,000,000 tons, compared with 16,500,000 tons a year ago. The reductions were mainly at power stations, gasworks, and house coal yards. Summer stocking at power stations and gasworks was adversely affected by the seamen's strike, but the stocks should be adequate to meet winter demand.

Stocks at merchants' yards were lower by nearly

500,000 tons, owing to the abnormal rise of over 1,000,000 tons in sales of house coal during the second half of the summer.

NCB AND SELF-FINANCING

MR. R. GRESHAM COOKE (Con.) asked to what extent the National Coal Board and the Gas Council were able to meet the annual cost of replacement of plant out of their own resources. Replying, the MINISTER OF POWER, Mr. Richard Wood, said that between vesting date and 1959 the Coal Board provided from internal resources about 45 per cent. and the gas boards about 37 per cent. of their expenditure on fixed assets.

It was difficult to distinguish between replacement and new investment in these industries and both had carried out programmes of major reconstruction which had made it difficult for them to achieve a higher rate of self-financing.

THE MINISTER OF POWER was not aware of any doubts concerning the procedure under Section 13 of the Coal Mining (Subsidence) Act, 1957, in the case of disputes.—Parliamentary Secretary to the Ministry of Power in a written answer to Mr. Norman Pentland (Lab.).

IT WOULD NOT BE PROPER to disclose details of the current trading operations of the NCB, said the Parliamentary Secretary to the Ministry of Power in a written reply to a question by Mr. Harold Neal (Lab.), who had asked what was the total loss sustained by the board on the export of coal during the current year.

INDUSTRY USED 820,400 TONS of liquid fuel in September, compared with 663,000 tons in September, 1959, and deliveries of oils mainly for domestic purposes rose from 51,900 tons in September, 1959, to 72,200 tons this year, said the Parliamentary Secretary to the Ministry of Power in a written reply to Mr. Will Owen (Lab. and Co-op.).

THERE ARE ABOUT 51,000 miners suffering from pneumoconiosis, the Parliamentary Secretary to the Ministry of Power told Mr. Harold Neal (Lab.). The Minister aimed to ensure research into the causes of the disease, satisfactory arrangements for diagnosis and medical treatment, suitable employment for men with the disease, and reduction of the dust menace to a minimum.

Britain Needs to Meet German Competition

BRITAIN will have to think ahead if we are to keep abreast of the German iron and steel industry which is "on top of the world," Mr. W. F. Cartwright, president of the Iron and Steel Institute, told members of the Cleveland Institution of Engineers recently. Referring to the "staggering efficiency of the German organization," he said that the Germans were pouring vast quantities of money into their new plants and were planning further big expansions in outputs.

He had visited three German steel plants recently and if we were to maintain our export trade we would have to work very hard indeed. There was enormous activity everywhere and they had fine machinery and plenty of ideas, he said.

Industry's Rating Relief to Go

ONE of the main purposes of the Rating and Valuation Bill, published last Friday, is to end the 50 per cent. derating of industrial and freight-transport (with the exception of BTC freight-transport for which the commission makes a payment of about £2,750,000 in lieu of rates). Another Bill is to be introduced to impose full rating on industry and freight-transport in Scotland in 1963, "or if that proves impracticable as soon thereafter as possible."

The general purpose of the legislation is to prepare the way for new valuation lists for rating due to come into force on April 1, 1963. Industry and freight-transport are now rated at 50 per cent. of their 1956 rental values, the proportion having been increased from 25 per cent. in 1959.

The Ministry of Housing and Local Government points out that the withdrawal of the 50 per cent. relief does not mean that the share of the rates borne by industry will be doubled—because the simultaneous rating at full value of shops, offices, etc., and the rating of houses at current instead of 1939 values will substantially offset any increase in industry's share of the total rate burden.

After re-rating in 1959 industry and freight-transport had a rateable value of about £80,000,000, of which over £77,000,000 is industry. This represents some 11½ per cent. of the total rateable value for England and Wales.

When Part II of the Bill comes into force, Clause 3 would enable the Minister at some future date, after appropriate consultations, to prescribe formula methods for valuing the property of the National Coal Board and other properties at present assessed by reference to the accounts, receipts, or profits of the undertakings occupying them (*e.g.*, the docks), or by reference to royalties (*e.g.*, quarries and other extractive industries).

The Minister's crumbs of comfort for industry are, in some instances, swept away where industrial premises can be assessed higher if their equipment comes under the Plant and Machinery Order, 1960. This refers particularly to large structural plant, such as that used in the steel and shipbuilding industries, and in cement and chemical works.

"Bitter disappointment" that further financial burdens "of considerable magnitude at what is likely to be a critical period in its history" was expressed by the Shipbuilding Conference. A spokesman for the British Iron and Steel Federation said: "The federation regrets that the re-rating of industrial property, which will increase the burden of steelmaking, should be introduced at a time when the Government is urging upon industry the need to expand trade in increasingly competitive markets."

"What is profoundingly disturbing about the Bill," Col. E. R. Mayer, president of the National Union of Manufacturers, commented, "is the provision enabling the Minister to derate residential property if he finds it necessary or politically convenient. This cuts directly across the main principle of the Bill and can only be done at the expense of other classes of ratepayer—almost inevitably industry."

LONG-SERVICE AWARDS were presented recently to four employees of Bamfords, Limited, agricultural engineers, of Uttoxeter (Staffs), by Mr. H. V. Bamford, the chairman. Each has completed over 50 years' service.

RTB's Iron-ore Needs

APPLICANTS' FOUR MAIN PROPOSITIONS

WAS the Iron and Steel Board right in the policy it set out in 1955 for making the maximum economic use of home ore? If so was Richard Thomas & Baldwins (Mineral Recovery), Limited, right in saying that it must look to Oxfordshire for the quantity of ore required? These were two of the propositions put forward by Mr. R. P. Widgery, QC, for RTB at the public inquiry into the company's application to mine 4,700 acres for ironstone in north Oxfordshire. He was making his final submission last Friday at the end of the inquiry which has occupied eight days.

He went on to say that if the company was right in looking to Oxfordshire could the necessary ore be found from the northern area around Wroxton where ironstone mining was already in progress and if it could not be found there, did the amenity arguments counter the applicant's own requirements to such an extent that it was in the national interest to deny the applicant's case. Those were the four main propositions on which the RTB case rested.

Replying to criticisms that RTB had "jumped the pistol" by building equipment at the Spencer Works, Llanwern, to take Oxfordshire ore before the inquiry opened, Mr. Widgery said the firm had to bear in mind that planning took time and if the objectors had found that the firm had no plans, they would have said it had given the matter insufficient thought.

Objectors Dust Storm

It had been suggested that the company was trying to influence the Minister by spending money on equipment which might not be used if the application was not granted. If the application failed the criticism would be met at the time and investigated by another authority.

"If the objectors find themselves in a bit of a muddle they must consider whether it is not of their own making," Mr. Widgery said. "I am reminded of the metaphor of the litigant who stirs up so much dust that it gets in his eyes and he complains that he cannot see. To some extent, the position in which the objectors find themselves is due to the dust storm of their own creation."

Referring to the economic aspects, Mr. Widgery said that if anyone was in doubt they should ask themselves: "Would the directors of the firm make these applications if they knew it was not an economically sound project?"

Local people were faced with an "ordeal of terrifying uncertainty" was the contention of Cmdr. E. Heywood Lonsdale, chairman of Chipping Norton Rural District Council. He suggested that RTB would probably cease to use Oxfordshire ore if it were no longer economic to do so just as the Steel Company of Wales, Limited, had done recently.

If the available rate of usage of the ore were reduced to 10 per cent. the workings would not last for 35 years as was proposed but for 140 years. It would suit the applicants to acquire the district as a reserve, he suggested, on which they could fall back from time to time as it suited them.

For Major E. Robb, a local landowner, Mr. J. M. Johnstone suggested that a statutory order might be made providing for the area to be opened up for ironstone mining only in an emergency under the Emergency Powers Act.

He added that the Minister of Housing and Local Government might be asked to apply for the appointment of a Royal Commission to decide future policy in the matter.

Mr. H. F. Yeomans, Ministry of Housing and Local Government Inspector, announced that he would visit the areas involved on Tuesday.

Integrated Steel Plant for Western Australia

AUSTRALIA'S largest steel producer, Broken Hill Proprietary Company, Limited, has agreed to establish over 18 years an integrated steel industry at Kwinana, 20 miles south of Perth, Western Australia. Using ore from the Southern Cross orefields, west of Kalgoorlie, the £A40,000,000 complex is designed to have a rolling mill with a minimum annual capacity of 330,000 tons.

The project depends on the consent of the Federal Government to the building of a standard gauge railway line from the ore deposits to the site. The line would cost £A35,000,000 of which the West Australian Government proposes the Federal Government should pay 70 per cent. and the State 30 per cent.

Rebate on Belgian Ship Plates

BELGIAN producer of steel plates, Fabrication de Fer de Charleroi, announces a rebate of 800 Belgian francs or $16 per metric ton on deliveries of ship plates. The rebate will be granted so long as the customer is a shipyard concern and the amounts bought total at least 500 metric tons.

The Charleroi firm already has the lowest list prices for steel plates in Belgium.

ILVA, the Italian iron and steel makers, 62.24 per cent. State-owned, has announced plans for the building of a new cold rolling mill on the outskirts of Genoa. To cost some 24,000 million lire and expected to come into operation in early 1962, the unit will produce some 650,000 tons of special sheets a year.

Orders Placed

British Induction Heating Installation for Germany

THE Loewy Engineering Company, Limited, Bournemouth, has received through Mannesmann Export, GmbH, an order for the supply of a mains frequency induction heating installation for steel billets. The equipment will be installed at Mannesmann, AG, Roehrenwerk, Remscheid, Germany. The value of the order is over £250,000.

The equipment to be supplied is for a nominal capacity of 21 tons per hour, with provision made to increase the output at a later stage to 28 tons per hour. It will have a power rating in excess of 10 mW, and it is the largest induction heating installation in the world ordered for a steel extrusion plant. The billet heating equipment is for a Loewy 3,100 tons hydraulic extrusion press plant for steel, of new design, which is at present under manufacture.

COMPANY, which recently acquired world manufacturing rights of Tin-A-Lum, a fluxless aluminium solder, Industrial Synthetics, Limited, has secured a contract worth $550,000 from the US.

CONTRACT worth approximately £90,000 for the construction of 50 rail tank wagons has been placed with the Powell Duffryn Engineering Company, Limited, by the Esso Petroleum Company, Limited.

BRISTOL OFFICE of Richard Crittall & Company, Limited, heating and ventilating engineers, etc., of London, S.W.1, has secured a £150,000 contract for the Winfrith Heath (Dorset) atomic research establishment.

H. J. GODWIN, LIMITED, pump manufacturers, of Quenington (Glos), has received a £100,000 order for pumping sets to be used for irrigation in the Middle East. A large number of the company's pumps are already operating in the area.

PLANT to handle and store flour in bulk in Moscow No. 3 bakery has been ordered from Baker Perkins, Limited, Peterborough. The plant, worth £127,000, will have a total storage capacity of 420 tons. The Russians will make the steel storage silos and supply the pipework to Baker Perkins' drawings.

SWITCHGEAR, valued at over £300,000, is to be installed by the General Electric Company, Limited, at the outdoor substation of the Central Electricity Generating Board at Corby (Northants). The equipment includes 13 132 kV, 3,500 mVA oil circuit-breakers, a 17-panel control board, relay panels, and outdoor isolators.

LEADING manufacturer of motor-cycles in Japan, the Honda concern, has ordered gear hobbing machines and other equipment, worth nearly £500,000, from Charles Churchill & Company, Limited, Birmingham. Mr. J. B. S. Gabriel, chairman, said that this was the company's first attempt at the Japanese market and that the prospects of further orders there were highly promising.

VALUED at over £200,000, an order covering the main gas valves for the Central Electricity Board's new atomic power station at Dungeness (Kent), has been placed with J. Blakeborough & Sons, Limited, Brighouse (Yorks). The valves, each of 78-in. bore, will control the gas ducts in which the heat generated by the reactors is conveyed at a temperature of nearly 800 deg. F to the steam-raising plant.

TWO ORDERS, together worth £352,000, have been placed with British companies by Industrial Cables (India), Limited, and Bahrad Steel Tubes, Limited. General Engineering Company (Radcliffe), Limited, is to supply impregnating plant for paper-insulated cables, and lead sheathing, and presses together with ancillary equipment. Stranding machinery has been ordered from Trafalgar Engineering Company, London, S.E.8.

MP Questions Sale of Colliery Tip

FOLLOWING a constituent's complaint, Mr. John Hynd, Labour MP for the Attercliffe division of Sheffield, is inquiring into the National Coal Board's reasons for selling the 800,000-ton tip at the disused Nunnery Colliery to a private contractor, who is reselling the contents to power stations in the North and the Midlands. The board has stated that it sold the tip for £40 000. It agreed that part of it might be suitable for low-grade power station fuel, but said that the transport costs to Manchester and Birmingham would be very high.

Mr. Hynd's agent said that the tip was more valuable than most because the washing plant was not modernized and a lot of inferior grade coal was thrown on to the tip. "No wonder coal is so expensive," he said. "Why couldn't the Coal Board or the Electricity Generating Board have dealt with the coal themselves?"

Mr. Peter Mullan, head of the company which bought the tip, said that it was probably getting about 26s. a ton for the waste as boiler fuel. "These tips are always a speculation like any business investment," he said. "I will not be able to say until we have cleared it what the profits will be."

CODE OF PRACTICE FOR THE COAL TRADE

SPEAKING at a meeting of the Women's Advisory Council on Solid Fuel in London on Thursday of last week, Mr. Peter Hawksfield, president of the Coal Merchants' Federation of Great Britain, said that the trade would co-operate wholeheartedly with the National Coal Board to implement a suggested code of practice.

Such a code, he said, would greatly improve the marketing of coal. The merchants would undertake to abide by certain conditions and conform to a standard of service which could be worked out by the board and the trade.

IME Associate Membership Examination

THE Institution of Mining Engineers has notified us that in its list of successful entrants for the examination for associate membership Mr. I. J. Jaquest was erroneously indicated as having still to qualify in Mining Legislation.

Mr. Jaquest holds the first-class certificate of competency issued by the Mining Qualifications Board. The list was published in IRON AND COAL in the issue of September 16.

RICHARD THOMAS & BALDWINS

Chief Engineer Among Ebbw Vale Appointments

MR. J. T. MILLS

CHANGES in senior engineering posts at the Ebbw Vale works are announced by Richard Thomas & Baldwins, Limited. Mr. James T. Mills, formerly chief electrical engineer, has been appointed chief engineer for the works, with control over mechanical, electrical, civil, fuel, and safety engineering departments. He is succeeded by his deputy, Mr. Alec W. Ellis, and the new deputy chief electrical engineer is Mr. Tom Lloyd. Following the death of Mr. F. E. C. Probyn, Mr. Eric W. Smallman has been appointed chief mechanical engineer.

Mr. Mills, who was born in 1916, has been at Ebbw Vale since the early days of the present works. He joined the English Electric Company, Limited, at Stafford, as an apprentice and in 1936 was appointed assistant district engineer in South Wales and South West England, transferring to Richard Thomas & Company in 1938 as assistant engineer in charge of hot strip mill and blooming mill electrical maintenance. Three years later he was placed in charge of the maintenance of all electrical equipment at the works. He was promoted deputy chief electrical engineer in 1954 and four years later chief electrical engineer. Mr. Mills was president of Ebbw Vale Metallurgical Society for 1957-58.

Mr. Smallman, who is 34, joined RTB two years ago as deputy chief mechanical engineer, but has had varied experience in the steel industry, starting as an apprentice with John Lysaght, Limited, in 1942. In 1949 he gained a first class honours degree in mechanical engineering at Bristol University and the following year joined the Brightside Engineering Company, Limited, as a development engineer. He returned to South Wales as assistant cold mill mechanical engineer with the Steel Company of Wales, Limited, in 1951, became mechanical engineer for the new No. 4 blast furnace at Margam in 1955, and then spent a year with the National Coal Board before joining RTB in 1958.

Mr. Ellis served his apprenticeship with Igranic Electric Company, Limited, Bedford, and joined Richard Thomas & Company at Ebbw Vale in 1939. From 1945 to 1953 he was assistant engineer on electrical development at the works. He was appointed electrical development engineer in 1954 and deputy chief electrical engineer in 1959.

Mr. Lloyd joined W. Gilbertson & Company, Limited, Pontardawe, as an electrical apprentice. The company was later merged with Richard Thomas & Company and in 1938 Mr. Lloyd was transferred to Ebbw Vale, eventually becoming works maintenance engineer.

FOR THE FIRST TIME in Britain, George Cohen, Sons & Company, Limited, members of the George Cohen 600 Group, is to offer fork lift trucks on contract hire. The new scheme, which is due to come into effect this year, has been prepared by George Cohen's in collaboration with the fork lift truck makers, Coventry Climax Engines, Limited.

MR. TOM LLOYD

MR. E. W. SMALLMAN

MR. A. W. ELLIS

Scots Coal Exports Decline in October

SCOTTISH coal exports suffered a slight setback during October with a total of 33,497 tons, compared with 38,486 tons in 1959, but the year's aggregate to date shows a substantial improvement at 425,637 (287,021) tons. Denmark remained the best customer, business including duff for industrial purposes and nuts for the domestic trade. The sharp rise in tonnages shipped to Holland helped to clear the overproduction of low volatile duff, for which home outlets are scarce.

Improved business with the northern Scandinavian group proved particularly encouraging to exporters, this trade having declined substantially in the past few years. Norway and Sweden were interested solely in nuts, but the Finnish tonnage comprised a single cargo of pearls, arranged at a time when these were almost a drug on the market. No further business is booked.

Details of exports for October and for the first 10 months of the year are as follow:—

Destination.	October.		January-October.	
	1960.	1959.	1960.	1959.
	Tons.	Tons.	Tons.	Tons.
Denmark	21,924	25,544	257,356	200,104
Holland	8,218	5,664	88,655	19,232
Sweden	2,311	4,064	26,055	13,813
Greenland	—	1,975	17,517	7,549
Germany	719	—	15,488	7,296
Norway	325	—	9,512	23
Finland	—	—	3,102	—
Eire	—	1,239	2,997	2,100
Yugoslavia	—	—	2,714	—
France	—	—	1,569	21,607
Canada	—	—	501	—
Faroes	—	—	142	464
Iraq	—	—	29	11
Belgium	—	—	—	14,770
Portugal	—	—	—	52
TOTAL	33,497	38,486	425,637	287,021

A surprise sale of a cargo of anthracite beans to Yugoslavia was the first business transacted with that country since nationalization. Towards the end of the summer an embarrassing surplus of this fuel accumulated, but no further sales have been fixed. Bunkers continued to decline. Shipments (including foreign, Admiralty, and trawler) amounted to 5,936 tons during October, compared with 9,339 tons last year. The total for the 10 months aggregated 46,891 tons, against 75,324 tons in 1959.

Prices of Basic Materials Lower in October

FOLLOWING the slight rise for September in the wholesale price index of basic materials and fuel purchased by manufacturing industry, the index declined last month to 100.7 (1954=100). At 96.8, the provisional index for basic materials for October is the lowest for two years and prices are on average rather less than in 1954.

In October, mechanical engineering and electrical machinery materials continued to show the downward price trends evident in recent months. The increase in coke prices was more than offset in each case by lower prices of copper, brass products, and rubber.

South Wales Ports' Trade Improves

INCREASE of 13.8 per cent. compared with the corresponding period in 1959 is reported for the trade through the South Wales ports for the four week period ended November 6. Trade amounted to 1,447,604 tons, 208,000 tons better than last year. Inwards traffic at 945,557 tons was 17.3 per cent. up and outwards traffic at 502,047 tons was 8.5 per cent. better.

Major import increases were in iron and steel goods (42,000 tons), other ores (28,000 tons), and iron ore (23,000 tons) and, after a long period of depressing export figures for coal, coke, and patent fuel, the totals showed a 5,000-ton increase. Tinplate exports were up by 9,000 tons, but iron and steel manufactures were down by 10,000 tons.

Tonnages through the seven ports (with last year's figures in parentheses) were as follow:—Newport, 2,037,073 (1,921,196); Cardiff, 2,056,828 (1,875,758); Barry, 1,122,679 (1,038,250); Port Talbot, 3,127,814 (2,394,605); Swansea, 6,895,913 (6,347,205); Penarth, 315,497 (320,783); Lydney, 24,519 (22,474).

Expelled Yorkshire Winders "Incensed"

MEMBERS of the Yorkshire Winding Enginemen's Association are "incensed" because they have not been included in a wage claim for mining craftsmen submitted by the National Union of Mineworkers, according to their secretary, Mr. Charles Guest. The association is to be expelled from the NUM on December 5 because of its refusal to merge with the union.

Mr. Guest said, after attending his last meeting of the sessional executive of the NUM on Thursday of last week, that when he challenged Mr. Will Paynter, general secretary of the NUM, on the question, Mr. Paynter said: "The time has come when the position of winding enginemen can no longer be tied up with craftsmen with regard to wage increases." The association executive is expected to discuss further moves at a meeting in about a fortnight.

Labour Shortage Forces Closure of Seams at North-Eastern Pit

NUMBER of faces are to be closed at Wharncliffe Woodmoor Colliery (Yorks) because of shortage of manpower. One face in the Haigh Moor Seam is to be closed because of bad industrial relations. For the National Coal Board it was stated that it was largely a matter of recruitment. Last month 37 men left the pit and of these 12 left the industry altogether. Only 10 were signed on.

A spokesman for the National Union of Mineworkers at the pit said that he believed men were leaving the mine because of out-of-date price lists. "Where wages are paid strictly on contract the men find themselves with less money than they would at other pits where allowances are more generous," he said.

GERMAN IRON AND STEEL INSTITUTE

100th ANNIVERSARY

—

Celebrations at 1960 Eisenhüttentag

Memento of the Occasion

By Charles W. J. Crawford

A large selection of works' visits for members from abroad and several special functions were included in the programme of the 1960 Eisenhüttentag to mark the 100th anniversary of the German Iron and Steel Institute. A highlight of the meeting was the presentation to the German institute of the Iron and Steel Institute Medal. The presentation was made by Mr. W. F. Cartwright, the ISI president. The medal is shown (approximately full size) on p. 1153. Our Metallurgical Editor gives his impressions of the meeting, which was from October 31 to November 7.

THIS year's annual meeting of the German Iron and Steel Institute, under the presidency of Prof. Dr. Hermann Schenck, was a special occasion, being the institute's centenary. Visits to various works, the presentation of appropriate technical papers, social gatherings on a grand scale, and a special issue of Stahl und Eisen were included in the celebrations. The attendance was a record. Of the 5,200 delegates, 350 were from abroad, and no fewer than 25 countries were represented.

There was a warm welcome for all visitors from other countries. On the eve of the Eisenhüttentag they were given a civic reception by the Mayor of Düsseldorf, followed by dinner and entertainment which included items by the Düsseldorf Boys' Choir. All the major German steelworks offered generous hospitality to visitors during the five days devoted to works' visits, while sight-seeing excursions were arranged for the ladies during that time.

August Thyssen-Hütte AG Duisburg-Hamborn

This was the first of the two works I visited. Arriving a little ahead of time at the meeting point in Düsseldorf, I found that six members of the coach party for the visit to the August Thyssen works were from the British iron and steel industry. The journey was for the most part along the famous autobahns, much of it being through lightly wooded country, the appearance of which was enhanced by the autumn sunshine.

On arrival, we were greeted in a large conference room in a new building by Dr. Michel, works technical director, who gave a detailed description of the works.

Our tour of the plant was a full one, accomplished, by the help of transport, in about two and a half hours. We started at No. 10 blast furnace the largest and most modern of a row of nine, No. 1 being no longer in existence. It is a furnace of 29½ ft. hearth dia., 49,500 cu. ft. working volume, and nominal capacity of 51,000 tons per

month. The blast furnaces are served by five coke-oven batteries of annual output of 1,680,000 tons—which has to be supplemented by bought coke—and four sinter strands making 240,000 tons per year. The furnaces work normally on a 50 per cent. sinter burden and No. 10 averages 1,800 ton/day of pig, coke rate being 12 cwt./ton, but has achieved an output rate of 2,200 ton/day when working on a 53 per cent. sinter burden, the coke rate then being 12¼ cwt./ton.

Steel production is by the Thomas process using oxygen-enriched air in a shop of seven 40-ton converters having a total output of 160,000 tons per month and by the open-hearth process in a modern shop of four 270-ton fixed furnaces and an old shop of five 60-80-ton tilting furnaces and one 50-ton fixed furnace. Total open-hearth production is 110,000 tons per month. We visited the modern open-hearth melting shop. The 270-ton furnaces have a hearth area of 1,065 sq. ft. and bath depth of 15 in. and are fired with coke-oven gas and oil. They produce at the rate of 28.5 ton/hr., inclusive of fettling time. Rimmed, semi-killed, and killed steel is made, some of the latter being bottom-poured and the remainder being top-poured. We saw the pouring of rimming steel in 20-ton slab ingots. I was interested to see a stand of seven immersion pyrometers between two furnaces and the hot junction of another undergoing repair.

Our tour continued to the soaking pits, ingot slabbing mills (two), heavy section and semis mill, parallel-flanged beam mill, semi-continuous mill, continuous 66-in. wide strip mill, 66-in. wide cold reduction mill, cold shear line, and continuous 66-in. wide strip galvanizing line. Our progress was quite leisurely and the guides were eager to receive and answer our questions.

One could not fail to be impressed by the modern installations one saw all round. This firm, whose works were severely damaged during the war and denuded of valuable plant under the policy of dismantling the German steel industry, had certainly not lost its pride and ability to make steel. It now ranks as the largest steelworks in Europe. Its total production in 1939 was 2,400,000 tons; it is now 3,200,000 tons and current plans will bring it to 3,600,000 tons. Further expansion to 4,300,000 tons is envisaged: this will include the building of a new oxygen steelmaking plant of two 150-ton converters.

Rheinstahl Eisenwerke Gelsenkirchen AG

My second works' visit took me to Gelsenkirchen. The coach party for this included Austrians, Frenchmen, Spaniards, Swiss, Italians, and Japanese; I was, in fact, the only British delegate. We were received by the works director, Dr. H. Boos. After the works' layout had been explained we set out for the blast-furnace plant.

This works produces foundry irons; two-thirds of its production goes to its foundries, the remainder being sold. Four blast furnaces are in operation and a fifth—a new one—is ready for lighting up. All are of approximately 10 ft. hearth diameter and have an output rate of about 600 ton/day; one furnace is at present producing 9 to 14 per cent. silicon pig. We made a thorough inspection of the blast-furnace plant and some of us spent some time on the sinter plant before going to the foundries. This works had also been virtually rebuilt after the war and so the foundries are in modern buildings. There are three of them, one for the production of a large variety of medium-size iron castings, another for cast-iron pipe production, and a third for the large castings which are not suitable for production by automatic moulding methods. The first two are very highly mechanized.

Iron from the blast furnaces is stored in a mixer and, in addition, there are eight modern cupolas, two with hot blast and basic linings. The cupolas charge 100 per cent. scrap and their iron is stored in the mixer along with blast-furnace metal. Metal is drawn off from this mixer as required. The foundries usually work on a 50-50 mixture of blast-furnace metal and cupola iron. However, when spheroidal graphitic iron

The Jubilee—Tapping

[Acknowledgments to Industriekurier, Düsseldorf.

Secretary *President*

DR.-ING. KURT THOMAS PROF. HERMANN SCHENCK

is required it is taken direct from one of the basic-lined cupolas.

Finishing our tour at the end of the morning shift, I noticed a custom that caused me some amusement. The workers all use leather brief cases for carrying their sandwiches and Thermos flasks: I was reminded of the sight of city workers hurrying home from their offices.

The hospitality shown to the visitors at lunch-time was in keeping with that experienced throughout.

Technical Meeting

The theme of the first true "Eisenhüttentag" on November 3 was "A Review of the Development in Production and Use of Steel in the Last 100 Years and a Look at the Future." Synopses of the four papers are given below; the full papers will appear in Stahl und Eisen.

"THE DEVELOPMENT OF METALLURGICAL PROCESSES AND THEIR METHODS OF OPERATION," by DR.-ING. F. A. SPRINGORUM.—A brief history of the iron and steel industry in the past hundred years. Description of the position of iron technology in Germany in 1960, tracing the development of metallurgical processes from 1860 to 1910 in relation to the raw materials, iron ore and scrap, and the introduction of the Thomas and Siemens-Martin processes. Position reached by 1910 and the subsequent building of much larger blast furnaces and the reduction of coke consumption per unit of iron. The problems of further development of the Thomas process, and the advent of oxygen-blowing processes. Modern open-hearth and electric steelmaking practices and the extensive use of oxygen. The prospect for future development.

"EXAMPLES FROM THE HISTORICAL DEVELOPMENT OF STEEL FORMING PROCESSES," by DR.-ING. E. L. W. OCHEL.—The importance of the working of steel before the introduction of the puddling process, the forming processes. the "contrivances" in early days of wrought iron production and working, and the phenomenal importance of wire and sheet. The two-high reversing mill as a prerequisite to increase in production capacities and ingot weights in the beginning of the liquid steel era. The development of wire drawing and wire-drawing machines at home and abroad. The sudden growth in demand for flat products and progress from the old two-high sheet mill to the modern mechanized tandem mill. The triumphant course of the hot and cold strip mills. The stimuli for production and use of steel products and future outlook.

"STEEL IN TECHNICAL DEVELOPMENT OF THE LAST HUNDRED YEARS," by DR. H. KALLEN.—The change-over from cast iron and wrought iron to liquid steel between 1860 and 1900. Steel as a material of consistent quality developed as a result of improved testing and knowledge and understanding of fundamental relationships between production conditions and properties. Examples of the adaptation of steel to continually growing demands and new requirements of forming processes and uses. Variety of alloying-treatment possibilities of steel as a basis of its further development.

"THE DEVELOPMENT OF THE FUNDAMENTAL TECHNOLOGY AND ITS INFLUENCE ON THE COST STRUCTURE OF IRON AND STEEL PRODUCTION," by DR.-ING. P. RHEINLANDER.—Reduction in costs, improvement in quality, and the rise in the competitive position of the German steel industry as a present goal, the stimulation through high labour cost of research on automation and rationalization, on new ore deposits and metallurgical processes, on power machines, and transport equipment, because of change in comparative prices of coal and iron, and on air and water pollution and waste disposal as a result of stricter regulations.

Iron and Steel Institute Medal

THE PRESENTATION WAS MADE BY MR. W. F. CARTWRIGHT, THE ISI PRESIDENT.

The formal business of the institute was then taken and a review of the work of the German Iron and Steel Institute presented by Dr.-Ing. Kurt Thomas, secretary of the institute, following which the names of six people elected to honorary membership of the institute were given.

Then followed the presentation to the German Iron and Steel Institute by the president of the Iron and Steel Institute, Mr. W. F. Cartwright, of the Iron and Steel Institute Medal. The medal has been awarded only once previously—on the occasion of the 300th anniversary of the Royal Society.

Festive Session

In keeping with the tradition of the Eisenhüttentag, part of the programme was devoted to cultural activities. Thus, at 9.30 a.m. on November 4, the session designated "Festliche Haupsitzung" was opened by the Wuppertal Orchestra conducted by Hermann Meissner playing the first movement of Beethoven's Symphony No. 7 in A Major. There followed a number of goodwill speeches, the first of which was by the West German Chancellor, Dr. Adenauer, who gave a short, but vigorous speech. Dr. Sohl, chairman of the German Iron and Steel Federation, was the last of the personalities to make a goodwill speech, and he combined it with the presentation on behalf of the federation of a jubilee donation of DM 2,000,000 to the institute to form the basis of a fund available to the rising generation for scientific work in relation to the iron and steel industry.

Dr.-Ing. Thomas spoke on the "The History and Activities of the German Iron and Steel Institute" and presentations of the Carl-Lueg Medal were then made to Prof. Robert Durrer, of Zurich, and Dr.-Ing. Otto Lellep, of the USA.

The main lecture of the cultural session, on the theme of "Tradition in a Changing World," was delivered by Prof. Dr. phil. J. Pieper, of Münster. His lengthy dissertation was given in a clear, enthusiastic manner right to the end. It was followed by the closing remarks of the chairman. The remaining function was a joint luncheon in the Rheinhalle, where about 1,000 delegates assembled for the final example of the hospitality offered on this 100th anniversary.

Jubilee Number of Stahl und Eisen

To mark the occasion of the 100th anniversary of the German Iron and Steel Institute, the October issue of Stahl und Eisen was of special size and content. The journal, which started 80 years ago, had in that issue a record number of pages—over 1,000. It contained about 30 contributions by authoritative writers covering German ore supplies, the revolutionary use of oxygen in steelmaking, the Maertz-Boelens open-hearth furnace, rolling of broad and parallel flange joists, production of seamless tubes, heavy forging practice, scientific management applications in steelworks' administration, the professional training of metallurgists and engineers, and the history of plant design in the German iron and steel industry.

Brazilian Steel Output Expansions

WITH the inauguration of the eighth steel furnace at the plant of the Companhia Siderúrgica Nacional (CSN), at Volta Redonda, in Brazil, the capacity of the plant has been raised to 1,300,000 tons of steel ingots, or 200,000 tons higher than that originally envisaged in the Government's five-year development programme.

During the past five years production capacity at Volta Redonda has nearly doubled, from 666,000 tons in 1955 to the present level of 1,300,000 tons, and during the same period total steel production capacity in the country has been raised from 1,200,000 to 2,300,000 tons. During the next five years the two large steelworks that are at present being constructed will together provide over 1,000,000 tons, while expansion plans for existing plants, such as the Belgo-Mineira, Mannesmann, and Volta Redonda, will provide at least another 1,000,000 tons.

CSN has announced that, in view of the development of the Brazilian steel industry and the completion of the second stage of the Volta Redonda expansion plan, the programme for the import of steel plate that has been in force since May, 1959, will now be closed.

Mannesmann is reported to have enlarged its expansion plans, with a view to raising output by three times, instead of doubling it. The company is to build a blast furnace with a capacity of 400 to 500 tons of iron a day, a plant for the processing of dolomite, a steel furnace, and a furnace for the rolled bar section of the plant.

Steel in Argentina

GOVERNMENT of Argentina has prepared a Bill for the amendment of the steel development law under which the Sociedad Mixta Siderúrgica Argentina (SOMISA) was established. Purpose of the amendment is to increase private participation in the company and to give private shareholders equal rights in its management.

In an article in the Buenos Aires Press, Sr. Arturo Acevedo argues that a steep rise in steel consumption is inevitable, because the industrial and economic expansion to which Argentina is committed will probably raise demand from the 1958 figure of 2,000,000 tons of finished steel products to about 4,500,000 ingot tons by 1965. Even this would bring the *per capita* consumption to only 440 lb. a year. Unless production capacity were raised quickly, more than 3,000,000 tons of this total would have to be imported.

Prospecting Activities in NSW

North Broken Hill, Limited, has commenced diamond drilling tests on a quartz ridge, four miles long, south-west of Ravenswood. The company is exploring for molybdenite. The first bore reached a depth of 900 ft. Broken Hill South, Limited, is prospecting a mineralized zone under Broken Hill city. This zone may contain a new payable orebody, but it would not be shallower than 3,000 ft.

GENERAL VIEW OF THE COLLIERY SHOWING THE COMPLETED NO. 2 TOWER AND NO. 1 TOWER UNDER CONSTRUCTION.

CYNHEIDRE COLLIERY

Increasing Anthracite Output in South Wales

Official opening of Cynheidre Colliery on Thursday of last week by Mr. H. E. Collins, the National Coal Board's member for production and reconstruction, marked the inauguration of the most expensive and complex reconstruction undertaken by the NCB. The reserves of valuable anthracite are highly disturbed by geological upheavals and horizon mining has been adopted as being the system most suited to the conditions.

DWINDLING output capacity of the anthracite mines in Gwendraeth Valley in No. 1 (Swansea) Area of the South-Western Divisional Coal Board made the development of Cynheidre Colliery, a large new mine, necessary. Many of the mines in the Area, working the shallower reserves, had become uneconomic and the National Coal Board decided to replace these smaller mines by a single, highly efficient colliery to work the reserves at greater depth.

The site chosen for the colliery, which by 1963 will have cost £14,000,000, is situated five miles north of Llanelly, overlooking the Gwendraeth Valley.

It has been designed to have a daily output capacity of 4,000 saleable tons when fully developed and it is intended to give employment for 2,800 men for at least 40 years. The reserves of at least 35,000,000 tons are contained in eight seams, the Big Vein, Gras, Braslyd, Ddugaled, Gwendraeth, and Pumpquart, which vary in thickness from 6 ft. to 2 ft. and have all been worked in the older collieries to be replaced by the new project.

Work on shaft sinking, undertaken by Schachtbau Thyssen, G.m.b.H., Mulheim, Ruhr, commenced in March, 1954, and was completed in September, 1956. Two concrete-lined shafts, No. 1 24 ft. and No. 2 20 ft. dia., were sunk on the main site to a depth of 800 yd., and an existing shaft, No. 3, three and a half miles from the main site was deepened 160 yd. Preparations are being made for sinking a fourth 18-ft. dia. shaft near the No. 3 shaft.

Pneumatic grabs were used to load out the debris from the shafts and the concrete for the shaft walls was lowered in steel pipes.

The anthracite coalfield in the Gwendraeth Valley is severely disturbed by extensive faulting and folding. Gradients up to 1 in 3 are encountered at working faces and the folded strata

are often vertical. These conditions are presenting geological problems in the development of the colliery and have largely been responsible for the adoption of horizon mining typical of continental practice.

Horizons at depths of 490 yd., 560 yd., and 660 yd. have been developed and the insets and connections between Nos. 1 and 2 shafts established at a depth of 760 yd. The main laterals forming the horizons consist of 16-ft. by 10-ft. high roadways and the cross-cuts formed by 14 ft. splayed to 15 ft. wide by 10-ft. arches. Connection between the horizons is by staple shafts and inclined drifts. At a later stage spiral chutes will also be used to lower the output from the upper to the lower horizons.

Initially coal will be mined from seams lying between the 560-yd. and 660-yd. horizons at No. 1 shaft and between the 490-yd. and 560-yd. horizons at No. 3 shaft. At the moment, approximately 500 tons per day is being produced, but by 1963 the output is expected to be 2,200 tons saleable per day produced by a total manpower of 1,800.

As far as possible, full face mechanization will be used to take advantage of modern techniques. Two Anbauhobel coal ploughs have already been installed in the Gras and Braslyd seams and arrangements are being made for the installation of a Mawco cutter-loader in the Big Vein Seam.

Coal loaded by the ploughs on to armoured conveyors at the coal face is carried by belt conveyors to central loading points, where it is loaded into 30-cwt. mine cars and hauled in 90-ton trains by diesel locomotives to the shaft bottom. The locomotives of 68 h.p. and weighing 10 tons are supplied by Hudswell, Clarke & Company, Limited, Leeds, and are fitted with a driver's cab at each end. Spotting creepers, pneumatic rams, and tilting platforms, interlocked for safety, are used to load the mine cars into the cages (Fig. 1).

All the output will finally be raised at No. 1 shaft, which is being equipped with a tower-mounted, four-rope friction winder. No. 1 tower winder is 140 ft. high and is expected to be completed in June, 1961. The shaft is to be fitted with two three-deck cages, each with a balance weight, to provide a flexible winding service from the insets. During the initial stages of developing the output of the mine only one cage will be installed, but provision will be made for the installation of the second cage at a later date. Each cage will carry 12 30-cwt. mine cars to give a total payload of 18 tons.

Friction Winders

Provision will also be made for two friction winders in the tower, but initially only one will be installed. The winder to serve No. 1 shaft, supplied by Associated Electrical Industries (Manchester), Limited, is powered by two 1,350-h.p. motors giving a normal rope speed of 40 ft./sec. The winder is to be fitted with Ward-Leonard control and will be entirely automatic in operation, no winding engineman being necessary when winding mineral.

The towers to house Nos. 1 and 2 winders are of steel girder construction and are clad in corrosion resistant aluminium corrugated sheets to provide weather protection. When No. 1 tower has been completed approximately 800 tons of steel will have been used.

No. 2 tower (Fig. 2) has already been commissioned and is now being used for development. Its final duty is designed for winding stone and materials. No. 2 shaft forms one of the upcast shafts in the ventilating circuit of the mine and is therefore fitted with airlock doors. During decking operations the cage itself provides the means of preventing the short circuiting of the air, while the normal sealing doors are opened to allow the free passage of mine cars. The doors are automatically operated in sequence with the movement of the cage.

FIG. 1.—UNDERGROUND MINE-CAR HANDLING EQUIPMENT AT CYNHEIDRE COLLIERY.

No. 2 shaft is also served by a tower-mounted, four-rope friction winder, shown in Fig. 3, and is entirely automatic in operation for winding mineral. During the automatic winding of coal or other mineral, the cage is set in motion by the onsetter, stationed at one of the three insets underground. When men are to be wound the banksman changes the winding circuit

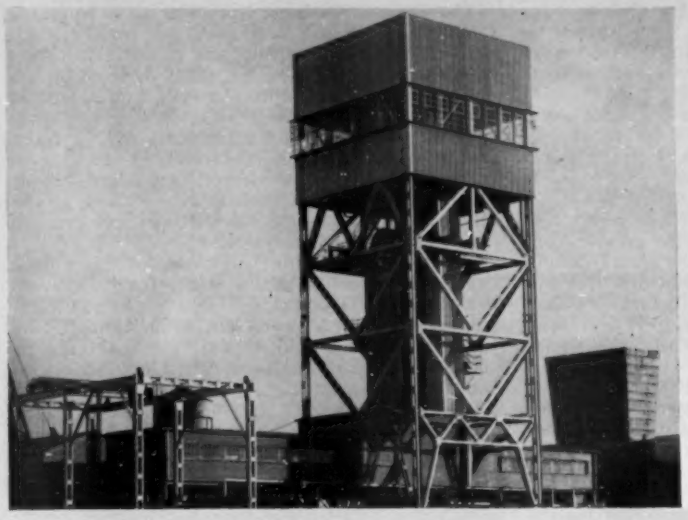


FIG. 2.—No. 2 WINDING TOWER AND CAR DECKING HALL.

to manual operation and controls the winding engine from a cabin, fitted with a winding and speed indicator, from the decking level. The winder, installed in a tower 125 ft. high, is powered by an 850-h.p. motor and is capable of winding at a normal speed of 32 ft./sec., giving 18 winds per hour from the lowest inset. No. 2 winder was supplied by the ASEA Company, Limited, the Swedish firm.

Access to both Nos. 1 and 2 winders for inspection and maintenance is gained by a service lift for each winder. No. 1 shaft is to be fitted with $1\frac{7}{16}$-in. dia. ropes and No. 2 shaft with ropes of $1\frac{1}{16}$ in. dia.

No. 3 shaft, which was sunk in the period 1939 to 1940 and which has never been used for coal-mining purposes, is to be mainly used for winding materials, but during the initial development period, the output is being wound. No. 4 shaft, to be sunk when the project is almost complete, will provide man-riding facilities together with final ventilation requirements.

Mine-car circuits for Nos. 1 and 2 shafts are of compact design to limit surface structures and to provide a quick return of the empty cars for refilling underground. When completed mine cars will be rammed automatically from the cages and will gravitate to tipplers where their contents are unloaded. The empty cars then gravitate to turntables, where their direction is reversed, lifted by creepers to overcome the height lost by gravity runs, and again gravitate to further turntables to direct them to the rams for re-entry into the cages. Each circuit is designed to hold no more than six mine cars, it being deemed good practice to keep the maximum number of cars underground. Two men are required to operate the surface mine-car circuit at No. 2 shaft, where the winding arrangements are complete; No. 1 shaft is to be similarly equipped and manned.

Conveyor belts receive the tipped contents of the mine cars, the coal being conveyed to the coal preparation plant to be washed and graded. Dirt wound up No. 2 shaft is tipped on to the same conveyor belt, which is fitted with a sliding arrangement so that dirt is delivered to a separate conveyor for disposal by plateau formation.

Preparation Plant

The coal preparation plant, costing over £1,000,000, is capable of washing 400 ton/hr. and is designed by the Fraser & Chalmers Engineering Works of the General Electric Company, Limited, Erith (Kent), in conjunction with Unifloc, Limited,

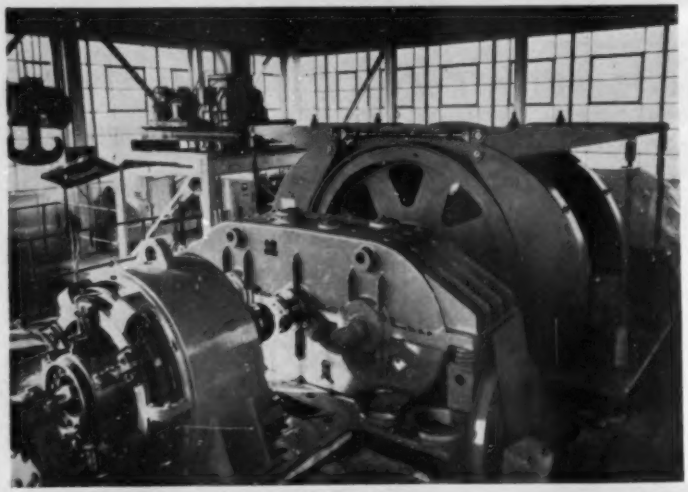


FIG. 3.—No. 2 TOWER WINDING ENGINE, POWERED BY AN 850-H.P. MOTOR AND FITTED WITH A SPRING-MOUNTED GEARBOX.

Swansea. The product is crushed to below 3 in. and the 3-in. to ¼-in. fractions are cleaned by two Chance cones. The ¼-in. to 0 fraction is cleaned by four froth-flotation cells with a total maximum throughput of 80 ton/hr.

The sizes prepared for the market are French nuts, 3 in. to 2 in.; stove nuts, 2 in. to 1⅛ in.; "Stovesse," 1⅛ in. to ⅞ in.; beans, ⅞ in. to ½ in.; grains, ½ in. to ¼ in., and washed duff, ¼ in. to 0. It is interesting to note that the washed duff is washed to a guaranteed ash content of 6 per cent.

Provision has also been made to receive coal by road and rail to be treated at the plant. During the development of output at Cynheidre, the preparation plant will be used as a central washery for other pits in the Gwendraeth Valley. The preparation plant is housed in a steel-frame building with brick-panelled walls.

The ventilation of the mine is by backward-bladed radial fan installations, designed by Davidson & Company, Limited, Belfast. When fully developed, 840,000 cu. ft. of air/min. at 12 in. w.g. will be circulating the mine. Arrangements have been made for increasing the duties of the fans by the addition of larger syncronous motors as underground requirements demand.

The anthracite reserves at Cynheidre are extremely gassy and the ventilation requirements are designed for a make of gas in excess of 1,000 cu. ft./ton.

Pumping arrangements at Cynheidre are almost complete and consist of special eight-stage pumps, designed by the Harland Engineering Company, Limited, Alloa. Each pump, driven by a 850-h.p., 6,600-V flameproof squirrel cage motor, will lift 667 gal./min. to height of 2,260 ft. The total pumping capacity of the plant will be in the region of 4,000,000 gal./day.

The main workshops, complete with travelling crane, will be laid and equipped with modern machinery so that repairs and minor fabrication work can be undertaken. A diesel-driven Conveyancer fork truck and two mobile cranes are in use for material handling. After loading into mine cars the material for underground use is taken to the shaft by diesel locomotive.

Pithead baths and a medical centre are already completed and in operation at No. 3 shaft. Baths at Nos. 1 and 2 shafts are in course of erection and will be opened early in 1961.

Except for the heating of water for the pithead baths, power for the mine is taken from the South Wales Electricity Board at 33,000 V. This is transformed to 6,600 V, conducted underground, and is transformed to 550 V near the coal face by air-cooled transformers supplied by Siemens-Schuckert (Great Britain), Limited, Brentford (Middx).

Administration of the project has been completely undertaken on the site and is divided into mechanical engineering, civil engineering, progressing, and finance departments. The highly disturbed nature of the strata has made it necessary to set up a geological section to record the nature of the strata through which drivages are being made and to plot the highly disturbed conditions to facilitate the development of the colliery.

Acknowledgment is made to Mr. J. G. Tait, Area general manager, No. 1 (Swansea) Area, South-Western Divisional Coal Board, for permission to visit the colliery and to publish this article. Special thanks are due to Mr. J. H. Pedley, engineer-in-charge of the Cynheidre project, for his co-operation in making available much of the information. Photographs are published by permission of the National Coal Board.

CYNHEIDRE

"AN ACT OF FAITH IN COAL"

IN his speech at the commissioning of Cynheidre Colliery, Mr. H. E. Collins, National Coal Board member for production and reconstruction, said the colliery represented the fulfilment of great hopes. It was an act of faith in coal and was the answer to the critics who blandly and falsely predicted a rapid decline in the importance of the coal-mining industry.

The South Wales coalfield had been endowed by nature with a rich inheritance in the variety and quality of its coal deposits and none was so important as the high-grade anthracites. It had long been recognized that the coalfield had the potential for an assured and great future. In the realization of this potential, particularly in the anthracite field, the problems were formidable, but by no means insuperable. "Mining has always involved the pitting of human endeavour against the forces of nature. This challenge of nature makes our industry an interesting and exciting adventure," said Mr. Collins.

The strata containing the valuable anthracite seams were subjected in ages past to intense earth movements, which had resulted in complicated geological structures. It was perhaps in the nature of "poetic justice" that these geological disturbances, after having been partly responsible for the formation of the anthracite, now provided considerable problems in its successful extraction.

The decision of the National Coal Board to develop the anthracite underlying the Gwendraeth Valley by sinking and equipping the new Cynheidre Colliery was an indication of the confidence of the

board in the future demand for this high-grade fuel and also in the ability of all who would ultimately be connected with the colliery successfully to exploit the coal despite the difficult geological conditions known to exist.

This important undertaking, with its modern facilities, marked a new era in anthracite production and would provide opportunities never previously available in the anthracite field. For many years to come Cynheidre Colliery would be a source of pride for all men engaged in this new venture. The colliery was not the work of any one man, of any one section, or of any one contractor. It was the culmination, the aggregation, of the work of a large number of individuals employed in the board's service and in numerous activities outside the board. It was an example of what could be achieved by co-ordination and co-operation. Steady and sustained continuance of this spirit was necessary to ensure the successful operation of this new colliery.

Demand for anthracite was very strong, and so far as could be seen, would remain so in the future. Its smokeless character in combustion and its suitability in the graded sizes for automatic stoking were important features which would continue to stimulate demand. Production from Cynheidre had come not a moment too soon and its rapid development was urgently necessary to meet consumer requirements. Therefore, when production capacity was fully developed, the extensive reserves available to the colliery would ensure continuity of employment for a great many years for the men in the Gwendraeth Valley and adjacent areas.

Mr. Collins hoped that the new colliery, which had cost about £14,000,000 to sink and equip, would engender a loyalty among all those engaged. In declaring the colliery commissioned as a coal-producing unit, he expressed the firm hope that all connected with it would be a happy community.

Blackdamp Alarm Lamp

NEW form of alarm to give automatic warning of the presence of blackdamp in a mine atmosphere has been designed by Mr. R. P. Rowlands, former divisional physicist at the South-Western Divisional Coal Board's laboratory at Ystrad Mynach. It can be set to operate at 19 per cent. oxygen or 1.25 per cent. carbon dioxide. Used in conjunction with a relay operated bell, it can give a remote warning of the accumulation of dangerous proportions of blackdamp. The alarm lamp makes use of the fact that as the oxygen content of its surrounding atmosphere decreases, the size of a flame is diminished and, consequently, the heat generated above the flame reduced.

A flat bimetal strip is positioned above the flame with one end fixed, while the other end, to which is attached a setting pin, is free to move as the strip curves on being heated. The setting pin, which is adjustable, is arranged to operate two switch contacts. With the flame set to a standard height in fresh air the curvature of the bimetal strip moves the setting pin away from the spring-loaded contacts, so that they remain open. If the flame diminishes due to a lack of oxygen, the bimetal strip will straighten, moving the setting pin until it presses the switch contacts together.

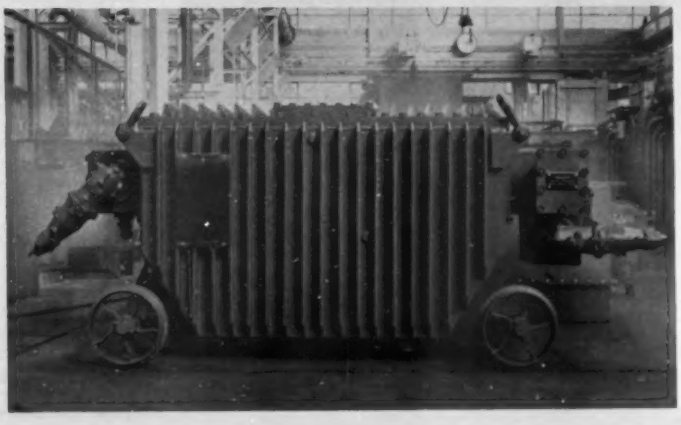
The contacts are electrically connected to terminals on the base of the lamp, to which is attached the alarm bell system. The lamp, a modified approved safety lamp, uses a high-grade paraffin fuel, one filling of which will last for more than the duration of a shift.

AEI UNDERGROUND MINING TRANSFORMERS

THE photograph shows the AEI flameproof dry-type Class "C" insulated underground mining transformer, 28 of which are on order from Associated Electrical Industries, Limited, for home and oversea, a number of them with a high-voltage circuit-breakers.

As there is no fire or explosion hazard with this type of transformer, it can be used right at the coal face. This avoids the voltage drop associated with long low-voltage cable runs, and is of special importance with the increasing use of power at the face.

The equipment has been awarded Flameproof Certificate No. 4474 by the Ministry of Power.



New Literature

NEW catalogues, booklets, and other publications recently received include those mentioned below. Readers wishing to obtain a copy of any of the publications referred to should apply direct to the address given, at the same time mentioning IRON AND COAL.

NCK-RAPIER, LIMITED, 32, Victoria Street, London, S.W.1—Several brochures and pamphlets dealing with the 1205 and 405 excavators have been produced.

MATBRO, LIMITED, Fork Truck Division, Horley (Surrey)—The Matbro Series III fork truck—"the best for the timber trade"—is described in a new leaflet.

BRITISH TRANSPORT COMMISSION, 222, Marylebone Road, London, N.W.1—All interested in transport problems will find much to interest them in Transport Age (2s. 6d.), the October issue of which is now available.

NATIONAL UNION OF MANUFACTURERS, 6, Holborn Viaduct, London, E.C.1—An article on modern developments in engineering insurance is among the contents of the November issue of the British Manufacturer.

NORDBERG MFG. COMPANY, Milwaukee, Wisconsin, USA—"How to Get the Most from Your Symons Cone Crusher" is the title of a new booklet. It discusses some of the common problems and faults encountered in crusher operation.

RICHARD THOMAS & BALDWINS, LIMITED, 82, Brook Street, London, W.1—November issue of Ingot News features the company's modern foundry and engineering work at Machynys in addition to giving all the latest news from the other works.

RANSOMES & RAPIER, LIMITED, Waterside Works, Ipswich — Publication No. 2/531 describes high-discharge truck mixers with hydraulic drive which give high-quality mix, big pay load, no down time, and cleanliness in sizes from 4 to 9 cu. yd. There is also (publication No. 1/534) a booklet called "The Truck Mixer Man," which, with the aid of humorous illustrations, offers sound advice to truck mixer drivers.

POWELL DUFFRYN, LIMITED, Powell Duffryn House, Cardiff—The P.D. Review, a quarterly magazine reviewing the activities of the Powell Duffryn group of companies, is now in its 31st year of publication. The autumn issue maintains the high standard of production which has long been associated with the journal and contains an attractive array of features, some dealing with the work of the group and others more general in character.

W. H. ALLEN, SONS & COMPANY, LIMITED, Bedford—Many interesting articles are contained in the November issue of Allen Engineering Review. Some of the subjects covered include "Deterioration of a Centrifugal Pump in Service," "Heat Recovery with an Expansion Gas Turbine at the Ardeer Works of Imperial Chemical Industries, Limited," and "Epicyclic Gears at Margam." These and the other features are attractively presented and well illustrated.

FEDERATION OF BRITISH INDUSTRIES, 21, Tothill Street, London, S.W.1—"The most striking proof of progress in the bearings industry in the last five years is that output per employee has risen by 10 times the increase in the number of people employed," states the introduction to an article on "Bearings Up to Date" by Mr. C. R. D. Tuckey (chairman of the Ball and Roller Bearing Manufacturers' Association) in the November issue of FBI Review (price 2s. 6d.). In "Clean Air Legislation in West Germany," Dr. Otto Wilhelm von Tegelen (Federation of German Industries) gives the salient features of the revised legislation and procedure adopted by West Germany to meet the problem of air pollution.

FREDERICK BRABY & COMPANY, LIMITED, Braby House, Smithfield Street, London, E.C.1—From his office in the company's new headquarters (the old building in Euston Road is to be pulled down to make way for a new road widening and development scheme) the chairman (Mr. Cedric Braby), writing in the October number of Braby of Britain News, refers to the past and the future. The original business was established in 1839 and turned into a company in 1865. Until recently, the company was often referred to as Braby of Euston Road; now, however, it is known by the more illustrious title of Braby of Britain, and the chairman writes confidently of the future of the group. Illustrated articles describe the current work of the member companies.

DEVELOPMENT AT DURGAPUR

MR. MALCOLM MACDONALD, UK HIGH COMMISSIONER FOR INDIA, LIGHTING UP COKE-OVEN BATTERY NO. 2 AT THE DURGAPUR STEELWORKS, WHICH REPRESENTS BRITAIN'S LARGEST EXPORT ORDER. THE WORKS IS BEING BUILT FOR THE GOVERNMENT OF INDIA BY ISCON, THE INDIAN STEELWORKS CONSTRUCTION COMPANY, LIMITED.

THE INSTITUTE OF WELDING announces that the second Christmas lecture to young people, "Sticking Things Together," will be given by Prof. J. G. Ball, Professor of Physical Metallurgy, Imperial College of Science and Technology, at 54, Princes Gate, Exhibition Road, London, S.W.7, on January 5 at 11 a.m. Admission is free by ticket obtainable from the secretary of the institute.

IRON AND STEEL INSTITUTE

IRON AND STEEL ENGINEERS' GROUP

Remaining Papers from Scunthorpe Meeting

Abstracts from the third and fourth papers read at the recent meeting at Scunthorpe of the Iron and Steel Engineers' Group are given below. The first two papers were given in abstract form in the issues of IRON AND COAL *dated November 4 (p. 1021) and November 11 (p. 1061), respectively.*

ENGINEERING ASPECTS OF THE REDBOURN DEVELOPMENT SCHEME

By P. M. HESKETH
(*Redbourn Works, Richard Thomas & Baldwins, Limited*)

MAIN objectives of the scheme were first, to raise steel output from less than 10,000 ingot tons to at least 14,000 ingot ton/week, and second, to increase quantity of billets rolled from about 6,000 tons to about 12,000 ton/week. At the present time about 4,000 ton/week of slabs are sent to Ebbw Vale and no mill capacity is available to roll this material into billets. When the developments have been completed, it is intended that the full output of steel should be rolled to billets.

To achieve these objectives it was necessary to carry out the following developments:—

Mines.—The development of a new open-cast iron-ore mine at Winterton which will increase the reserves of local ironstone by some 25,000,000 tons.

Coke Oven.—The rebuilding of 41 old coke ovens and the construction of a new battery of 62 ovens, to raise the output of coke from some 8,000 ton/week to about 10,500 ton/week.

Ironmaking.—An increase in ironmaking capacity, first by enlarging the diameters of the existing furnaces, and secondly by the installation of a modern ore preparation and sinter plant which will feed to the furnaces some 24,000 ton/week of high-grade sinter. Together, these developments will raise the iron make from about 7,000 tons to about 11,000 ton/week, and at the same time will give a lower coke rate for a better quality iron.

Steelmaking.—The installation of the rotor steelmaking process to pre-refine hot metal before delivery to the open-hearth furnaces. This treatment will reduce the tap-to-tap time from about 11 hr. to about 8 hr.

Mill.—To raise the billet rolling capacity from 6,000 to more than 12,000 finished tons, the old reversing mill is being replaced by a continuous billet mill comprising four roughing and four finishing stands. By the addition of a further two roughing stands this mill will be capable of dealing with up to 20,000 ingot tons should the need arise.

Engineering Shops.—To accommodate the new continuous billet mill adjacent to the existing cogging mill and soaking pits, it has been necessary to transfer the engineering workshops to an entirely new building. The developments will also demand better maintenance facilities and these are being provided in these new central engineering workshops. Bearing in mind that these major construction programmes are being carried out concurrently while the plant is operating at normal levels of production, it will be appreciated that the engineering planning must be of the highest quality.

Special Problems which have Arisen

All schemes of this nature must be engineered so as to overcome the obstacles imposed by limitations in time, space, and finance. Special problems inevitably arise and the main features of one of these problems are dealt with here.

Furnace Rebuilds.—During the developments, four OH furnaces were to be rebuilt to a new design based on single uptakes, enlarged slag pockets, and the use of retractable fuel burners. This design incorporates a complete basic suspended roof, suspended slag pocket arches, and slag pocket main walls. These changes had already been tested on a previous furnace and had shown improvements on production from that of the original furnace.

The rebuild of the furnace involved the complete wrecking down to foundation level before erection of the new structure.

The first to be rebuilt was *A* furnace and all the materials were prepared in our own workshops. Dismantling began on July 12, 1958, and the furnace was completed and gassed on August 21, 1958. The annual "stop" fortnight occurred during this period and the furnace could not be fully manned as personnel were engaged on other work. This had been realized, but as the furnace would not be operating during this period it was decided

to proceed. This rebuild required 40 days, which was too long a period to have a furnace out of production.

Means of cutting down this time were examined and from the records of the *A* furnace rebuild it was clear that, although materials had been carefully prepared, a significant amount of site work was involved; also the number of crane lifts required was high. It was, therefore decided that preparation for *C* furnace would aim at complete assembly of the furnace structure in the engineering workshops, dismantling in the largest possible transportable sections, and re-erection on site using the minimum number of crane lifts.

Had it been possible to transport the complete structure, which was in the region of 350 tons, in, say, three sections, it would have been a very simple matter to make the fabrication sound enough to travel. Bulk and weight made this out of the question in the engineering shops and crane girder headroom was the deciding factor in the melting shop.

However, large sections, such as the port ends and block ends, were left assembled and this meant the saving of 60 lifts on site. In addition, the building of all foundation sections at the end of the furnace stage further reduced the actual number of lifts during erection. To reduce further the load on the stage crane and to expedite the dismantling of the furnace, a special track and bogie were prepared to be fixed across the furnace stage after gas was taken off the furnace. This track gave access to the adjacent magnet crane bay.

Return to Production in 18 Days

Personnel worked on shifts during the whole of the rebuild. The weight of steelwork erected was over 350 tons and the number of bricks used was 257,000 pieces with a total weight of 1,200 tons. Despite this, the furnace returned to production only 18 days after wrecking began. Detailed costs taken during the rebuild, including the prefabrication in the workshops, showed that in addition to saving time the method used was cheaper and valuable furnace hours were gained.

For the next furnace rebuild on *B* furnace the same methods were used and, in addition, the furnace pipework for water cooling was prefabricated to reduce further the site work required. This rebuild was completed and flares lit on the 16th day after demolition began. A large amount of extra work was involved in this case as the chequers were in bad condition and it was decided to redesign to give a single chamber at each end of the furnace, using a flat fully suspended roof. During the rebuild, this involved an additional 50,000 bricks as compared with *C* furnace.

The fourth furnace has already been assembled in the engineering shops and site work will take place at the end of 1960, and it is hoped to equal or better the previous times. This work on the OH rebuilds has once again shown the value of careful planning and the advantages of doing as much as possible away from the producing unit.

DEVELOPMENTS AT APPLEBY-FRODINGHAM SINCE 1954

By E. A. Atkin and E. F. Farrington
(*Appleby-Frodingham Steel Company*)

In company with most other iron and steel plants, the recent history of Appleby-Frodingham has been one of continued expansion and improvement of its production processes.

The plant is the result of the amalgamation of two separate companies, the acquisition of a third, and the extension of its territories over contiguous areas in connection with ore mining.

Today, Appleby-Frodingham directly employs 11,700 people. Traditionally, it produces plates and sections, based upon the mass production of mainly ordinary quality steels in basic OH tilting furnaces from phosphoric pig-iron derived from home ores. Present capacity is 1,600,000 tons of pig-iron and 1,200,000 tons of ingots per year.

The plant occupies 1,300 acres, is served by 110 miles of internal railways, 47 locomotives, and 12 miles of roadways. It receives nearly 8,000,000 ton/year of raw and other materials, despatches about 1,500,000 ton/year of finished and other materials, and handles 7,000,000 ton/year of internal traffic exchanges. It uses 375,000,000 units of electricity and 6,000,000 tons of water per year.

Plant Development from 1954 to 1960

Coke Ovens.—The original installation of 66 ovens was extended in 1951-52 by the addition of Nos. 3 and 4 batteries, thus doubling plant capacity. The use of blast-furnace gas for underfiring was leading to the fouling of the regenerators on Nos. 1 and 2 batteries. To prolong their life, as well as to avoid similar trouble occurring on the rest of the plant, a horizontal electrostatic precipitator was built to clean the blast-furnace gas supply to the coke ovens. This was completed in 1958. In 1955, to secure additional coke of the right quality for the blast furnaces, Nos. 5 and 6 batteries were ordered with the object of working a five-battery plant (*i.e.*, five working and one rebuilding). These batteries were completed early in 1959, but owing to trade conditions then existing, they were not lit until the end of November, 1959.

A new pure-products plant has just been completed to replace an earlier plant built for the first two batteries. Work is nearing completion on the construction of a plant to desulphurize 32,000,000 cu. ft. of coke-oven gas per day.

Ore-preparation Plants.—In 1955, an increase in ironmake was authorized. The increased ironmake required was achieved by adding units to the Seraphim ore preparation plant, and by modifying the sinter cooling and return fines system on the Apex plant to bring it into line with proved features on the Seraphim plant.

On the Apex plant a new system was installed to extract the return fines to a separate plant where they could be cooled, screened into two sizes, and fed back into the raw feed systems at a controlled rate. This work was completed late in 1956. In

1959, an experimental granulating drum was introduced to feed one of the Seraphim sinter strands.

Blast Furnaces.—In 1954, the four-furnace plant had an initial capacity of 23,500 ton/week. Furnace trials, using Seraphim sinter, revealed that it had a potential of 29,000 ton/week given additional blast air. Thus when the additional ironmake was authorized in 1955, it was only necessary to carry out the work already described on the ore preparation plants, and to add blowing and gas-cleaning capacity to the ironworks.

The blowing plant added consisted of a 150,000-cu. ft./min, 35-lb./sq. in. "split wind" centrifugal blower driven by a 20,000-h.p. steam turbine supplied from a blast-furnace gas (alternatively oil) fired water-tube boiler rated at 135,000 lb./hr. at 450 lb./sq. in. gauge and 760 deg. F. This entailed alterations and additions to the condenser and gas-cleaning plant water supply and cooling arrangements. Subsequently, further improvements in techniques supported by further furnace trials, have allowed iron production to be raised to around 31,000 ton/week and have paved the way for the next major advance.

Melting Shops.—In 1956, an additional 350-ton capacity OH furnace was built in the Frodingham shop to supply ingots to another branch of the combine. At the same time a number of additional service installations, such as an ingot stock gantry, a refractory grinding plant, a new basic slag plant, and steelfoundry, were built.

In 1956-57 attention was directed to ways and means of increasing output from the existing steelmaking plant. This led to the establishment of the Ajax process and to the conversion of the first OH furnace (*B* furnace in the Frodingham shop) in January, 1958. Since then two further furnaces have been converted (*L* and *N* in the Appleby shop) and more are planned. This work has already been described by Jackson *et al.** To supplement oxygen supply, a 100-ton/day oxygen plant is being built.

Plate Mills.—Here a major programme of re-equipment is in its final stages, the object of which is to raise production and to improve the quality of the finished plate. In 1954, the total finished production was about 400,000 ton/year. Now, in 1960, it is about 500,000 ton/year.

(1) SOAKING PITS.—Since 1954, two four-cell one-way fired recuperative soaking pits have been installed, one in place of an original two-way fired regenerative type. One electric soaking pit was added in 1957, and one controlled cooling pit in 1959. In preparation for the above, two new soaker cranes were installed in 1954-55 which required new crane girders and the raising of the roof over the building.

(2) 7-FT. SHEARLINE.—A new shearline was commissioned in 1957. It consists of a rotary trimmer-slitter shear with associated plate-handling devices and scrap disposal mechanisms, and two sets of cross-cut shears with length gauges, scrap shears, and piling tables. A new despatch bay was also built. The line is designed to have a throughput capacity of 4,000 tons of finished plate per week of 127½ hr., based on an average plate of 59 in. wide by ¼ in. thick by 34 ft. long.

(3) SLABBING MILL.—The new slabbing mill was completed in December, 1959. The mill is a conventional two-high, high-lift slabbing mill having rolls of 114-in. barrel length and 45 in. dia. The rolls are hydraulically balanced by an independent accumulator system and are supported in fabric bearings. The roll assembly is supported on a retractable sledge to facilitate quick roll changing.

The screwdown gear, powered by two 150-300-h.p. motors designed for speeds up to 220 in./min., is equipped with automatic screw control initiated by photocells on each side of the mill. The breaker block on each screw is fitted with load cells, and the reading is transmitted to the control pulpit. Provision is made for cancelling the automatic screw control, and the operator can switch from automatic to hand control instantaneously. The mill is operated by one man.

(4) 12-FT. PLATE MILL.—The original plate mill, built in 1926, consisted of a 12-ft. roughing and a 10-ft. finishing mill, both two-high, built in line on a common drive. This system had worked well for 30 years, but could no longer meet the current demands for quality and output, and maintenance costs were rising. It was accordingly decided to install a new 12-ft. four-high finishing mill downstream from the original, and a new 12-ft. two-high roughing mill in tandem with it.

The first phase was to replace the 10-ft. finishing stand with a 12-ft. wide, four-high unit driven by twin motors. The second was to supplement the existing shearline by a complete new rotary shearing and conveying line for 12-ft. wide plates; and the third was to replace the 12-ft. roughing stand by a new twin-motor driven two-high stand. The four-high finishing stand was installed during the two weeks' annual shut-down in August, 1958, the shearline during 1959, and the two-high roughing mill in July, 1960. Two additional bogie-type reheating furnaces (making five in all) having one and a half times the heating capacity of the original were built as part of this development.

BOILERPLATE NORMALIZING FACILITIES.—These were added in 1956-57 and comprise two batch-type heat-treatment furnaces, a cold leveller for 2-in. thick plates, and a cross-cut shear for 1½-in. thick plates.

Frodingham Section Mills

The conversion and reconstruction of the Frodingham mills was completed in 1949. In 1953 a new stripper shed was built to replace the original; and in 1955 a new roll-turning shop and office was built. In 1956 a new soaker was added. In 1954 production amounted to some 350,000 ton/year and is now about 400,000 ton/year.

Perhaps the most significant addition in recent years at Appleby-Frodingham is the installation of the universal beam mill now proceeding. While

* A. Jackson *et al*, JISI, 1958, 190, 1-29.
* A. Jackson, *ibid*, 1959, 191, 337-342.

not increasing capacity, it will add the universal range of sections to the long-established BS range. The beam mill consists of a universal roughing group and a single-pass universal finishing stand. The roughing group, a universal and an edging stand, will be supplied with formed blooms from the 32-in. section mill via a skid transfer bank.

One of the interesting engineering features of the new beam mill will be the methods employed for the disposal of scale. The system will consist of two collecting basins, one at the roughing group and one at the finishing stand. Scale, which will gravitate to the bottom of the conical collecting basin, will be pumped away to a series of hydro-cyclones graded by size and design to take out the varying sizes of scale. Scale which is too fine to be taken out by the hydro-cyclones will be taken out by conventional sand filters.

Other Developments Since 1954

(1) LOCOMOTIVES AND CRANES.—The original steam locomotive and crane fleet is being replaced by diesels. So far, 18 out of 47 locomotives have been replaced and 10 out of 30 cranes.

(2) WASTE-HEAT BOILERS.—It is planned to equip all steel furnaces with waste-heat boilers, and so far six have been equipped. When the scheme is complete, it is envisaged that all satellite fuel-fired steam-raising plant other than the coke-oven boilers will be closed down. These will be retained to serve the coke ovens and to act as a balancing unit for the whole works.

AIR POLLUTION.—Smoke emission from boilers is now negligible; emission from locomotives is still the largest source, but is being reduced by the changeover to diesels. Dust emissions have arisen in the past mainly from the ore preparation plants, but now melting shops are a potential source. The arrangements on the former are being continuously extended and on the latter have now got beyond the experimental stage. One bag-filter plant and two dry electrostatic plants are in service on Ajax furnaces. Gaseous pollution is being reduced as waste-heat boilers replace fuel-fired boilers, and will be still further reduced when the coke-oven gas desulphurization plant comes into service shortly.

OFFICE AND AMENITY BUILDINGS.—Since 1954 an extension to the general offices has been built. Similarly, offices have been provided for the engineering, production services, education (including training workshops and lecture-room facilities), test house, coke ovens, and section mills departments. New welfare buildings have been built for some 2,000 people, including a new medical centre. The central laboratory has been doubled in size.

Future Developments

In the spring of this year (1960), a development plan was approved by the Iron and Steel Board embracing iron and steel making and rolling plant. In broad outline, this plan provides for both iron and steel making capacities to be raised to about 2,000,000 ton/year, the construction of a continuous casting plant for blooms, and for a billet and rod-bar mill. Brief particulars are as follow:—

Ironmaking.—Further production-scale furnace trials have revealed that if the furnaces can be charged with a graded sinter, then the existing blast-furnace plant has a capacity of approaching 40,000 ton/week if provided with additional stove and gas-cleaning plant capacity.

The ironmaking plan therefore includes:—Four additional sinter machines with 168-ft. long by 8-ft. wide strands complete with 67-ft. mean dia. sinter coolers, return fines conditioning system, and improved sinter screening on all plants; three additional ore driers; an ore fines bedding plant; four additional blast-furnace stoves; extensions to gas-cleaning plants; one additional 135,000-lb./hr. blast-furnace gas-fired boiler; all necessary auxiliary plant and services.

When complete the combined sinter plant capacity will approach 150,000 ton/week of which rather more than 110,000 ton/week will be available to the blast furnaces and 40,000 ton/week will be undersized returns for re-sintering.

Steelmaking.—It is planned to convert eight OH furnaces to operate the Ajax process and one OH furnace to an active mixer. Three furnaces have already been converted and when the conversion programme is complete, steelmaking capacity will approach 40,000 ingot ton/week. Each Ajax furnace will be equipped with a waste-heat boiler and a fume-cleaning plant.

Continuous Casting.—It is planned to install a continuous casting plant having a capacity of 5,000 ton/week of 9-in. square blooms. This will be a four-strand machine with a maximum casting speed of 60 in./min. The maximum cut lengths will be 24 ft. 6 in.

Billet and Rod-bar Mill.—The billet mill will consist of a reversing breakdown mill followed by a continuous billet mill for the reduction of cast or rolled blooms to appropriate billets for the rod-bar mill. The rod-bar mill will have four strands, laying and pouring reels, and provision for a straight cooling bed to be added later.

INTERACTION BETWEEN FLUIDS AND PARTICLES

FIRST part of the third congress of the European Federation of Chemical Engineering will be held in London from June 20 to 26, 1962, on the occasion of the Chemical and Petroleum Engineering Exhibition at Olympia. The major event in the programme is a three-day meeting organized by the Institution of Chemical Engineers on "Interaction Between Fluids and Particles."

It is expected that there will be a large attendance of experts from many countries to hear and discuss the latest developments in the field.

Suggestions for papers for inclusion in the programme are invited. Title or subject and summary or other brief description should be sent to the general secretary of the institution at 16, Belgrave Square, London, S.W.1.

COAL MINING TODAY

Cadman Memorial Lecture

By F. G. GLOSSOP

This year's Cadman Memorial Lecture to the Royal Society of Arts was given by Mr. F. G. Glossop, production director, North-Western Divisional Coal Board, at a meeting on Wednesday of last week, with Mr. R. G. Baker, president of the Institution of Mining Engineers, in the chair. We print the following extracts.

HAVING critically examined all the possibilities, the National Coal Board decided to stock coal rather than go on to short time in 1958-59. For two years recruitment has been restricted so that natural wastage would cause such a run down of manpower that stocking would cease in 1960 and lifting from ground stocks begin in 1961. In its aim this has been successful. A number of marginal pits, where output was expensive, have been closed and the efficiency of the industry in output per manshift has risen rapidly—from 1.23 tons in 1955 to 1.399 tons in the first half of 1960. On the other hand, the wastage of manpower has been unequal. The numbers leaving in the northern fields have been low, whereas in the Midlands, the most productive field in the country, wastage has been high.

Distribution of Labour

It may be of interest to consider the distribution of labour at a colliery. Taking the country as a whole, the proportion of shifts spent at various tasks is roughly as follows:—Face, 37 per cent. (excluding officials); elsewhere underground, 43 per cent. (36.5 per cent. men, 6.5 per cent. officials); surface, 20 per cent.

The primary function of men on the "surface" and "elsewhere underground" is to serve the coal face, so that production can be a regular, continuing, and safe process; consequently, for each mine at a given output there must be a certain number of men engaged in these two branches even when the number of face men is minimal. In other words, after wastage has proceeded so far at any particular mine, the next man to leave from either "surface" or "elsewhere underground" must be replaced by one from the "face." Up to this point the efficiency (output per manshift) rises, partly due to the concentration of operations and partly to the incentive effect of restriction of output on the men. Once this stage has been reached, the output begins to fall more rapidly than manpower, and, conversely, costs rise steeply. This latter point is deeply significant.

Deep mines such as are worked in Britain are not flexible instruments. Maximum output is determined by the capacity of the shafts and winding equipment. The manager is normally expected to maintain maximum output and, to do this, must plan for underground development to be carried out consistently ahead of requirements. This is not always easy, because in coal mines the strata tend to close up, so if the development is too far ahead it may have to be done over again in conditions which have deteriorated.

The total cost contains a large proportion of fixed charges which are independent of the output; hence, any fall in tonnage will have a more than proportional effect. This fact is important when reductions of output have to be considered. Indeed, sometimes it pays to keep open a losing colliery because of the effect its tonnage has upon the output, hence the cost, of an Area.

As to demand, it is difficult for most major consumers to predict their requirements for many years ahead. To take one case of outstanding importance, the demand from the electricity generating industry in 1947 was for low ash "smalls," and washeries were built to cater for this demand. Today this is the very quality they do not want: fairly consistent high-ash dry "smalls" are now required, and, again, plants are being built to suit, some completed only a few years ago having to be modified. The fact that this change has come about through great improvements in generating efficiency is to be warmly welcomed in the national interest, but it demonstrates that forecasting is still far from an exact science and hence the overall output required of the industry is hard to predict.

Face Output

Higher face output per manshift is needed if the industry is to hold its own.

On orthodox faces the coal is undercut, blasted, and loaded by hand on to the conveyor, after which the conveyor is moved forward ready for the next day, the packs are built, and the back props withdrawn. Such faces still produce about 60 per cent. of the total output, so that what happens on them is significant.

On a typical face 200 yd. long in a 4-ft. thick

seam, undercut 5 ft., the men will be distributed something like this:—Undercutting, 6 (7.5 per cent, of the total); drilling and blasting, 6 (7.5 per cent.); filling, 30 (37.5 per cent.); moving conveyor, 4 (5 per cent.); packing and drawing off, 19 (23.5 per cent.); ripping, 10 (12.5 per cent.); steel checkers, etc., 5 (6.5 per cent.). Total number of men—80. Total output per day—400 tons run-of-mine.

It will be seen that the actual fillers constitute little more than a third of the face men, and when it is recollected that the face men themselves are only about 37 per cent. of the total labour force in the industry, the importance of improving their ratio is easily seen. It is recognized that it is unlikely that a greater tonnage will be loaded per filler; that is one of the benefits to be conferred by power-loading. Nor can the numbers engaged on undercutting, drilling, moving conveyors, or ripping be much reduced in customary methods of work.

One aid to efficiency, however, lies in the treatment of the extracted area, the "gob" or "waste." The props set at the face only hold the nether roof; they are quite unable to support the strata above.

If the props carry a load of 20 tons each and are set 4 ft. apart each way the supported weight per square foot is 1¼ tons, whereas for a working 1,500 ft. deep, which is about the average depth in this country, the total load per square foot would be about 100 tons and per prop no less than 1,600 tons. If the working face is 600 ft long and the supported width is limited to 12 ft., the total load reaches the huge figure of 720,000 tons.

Obviously, the roof strata must support themselves to a large extent, and it is the miner's job to see that they do so. This can be done by keeping open only the narrowest practicable space for working and providing behind that a cushion on which the subsiding roof can settle. Such a cushion can be made of rocks from the strata built to form wide, dry stone walls or packs, spaced at intervals along the waste, say, walls 4 yd. wide with spaces of 8 yd. to 10 yd. Or the space can be packed solid with small debris packed by hand, or better, projected into the cavity by compressed air.

Solid packing is effective, but, being costly, is normally reserved for special cases.

Packing occupies 23.5 per cent. of the face men, and in recent years there has grown up the practice of "caving," *i.e.*, of encouraging the roof in the waste to collapse so freely that it actually fills the void as thoroughly as hand packing does, thereby avoiding the need to build packs.

Air Blasting

There are two other developments on the face which are worthy of mention, namely, the use of compressed air for blasting, and the practice of forcing water into holes drilled in the seam to reduce the amount of coal dust in the atmosphere and to permit the discharge of explosives when actually under water pressure. The air blasting process is both safer and more convenient than ordinary explosives. Providing the machine blasts more than 400 tons of coal per day it is as cheap as ordinary explosive, becoming cheaper the more it is used.

The idea of pumping water into the coal *in situ* to suppress dust is not new, but it is only comparatively recently that apparatus has been available for doing so easily and quickly. Not all coals are amenable to the treatment: some are so dense that the water cannot penetrate even at 4,000 lb. per sq. in.; others are of such open texture that the water passes through the seam into the roof or floor, causing them to disintegrate.

An extension of the process has led to pulsed infusion shotfiring. In this the shothole is first infused with water under pressure, then the apparatus is taken out, the explosive inserted, the apparatus replaced, the water pressure re-applied and the explosive fired. The risk of igniting firedamp is thereby minimized, and the amount of dust is reduced. The method cannot be used when the coal is undercut, as the water could not be retained, so that the quantity of explosive required per ton of coal is somewhat greater than for normal blasting.

A development of recent date consists of the use of bolts with expanding heads for holding weak roof strata together, thereby increasing their strength.

Power-loading

On power-loaders the latest developments might be mentioned. The primary purpose of the power-loader is to tear the coal from the solid face and put it on to a conveyor. Broadly speaking, the more successful the machine the more "smalls" it produces. The demand for "large" is one reason why power-loading has not advanced more rapidly this last year or two. Progress has been made chiefly in improved performance of existing machines by the use of greater horsepower and the application of hydraulic drives. From faces 250 yd. long in seams, say, 3 ft. 6 in. to 4 ft. 6 in. thick, it is fairly common now to obtain by power-loaders up to 1,000 tons per day at a face output per manshift of 11 to 12 tons, and in south Yorkshire recently figures have been published showing face advances of up to 23 yd. per week. This was something quite unthought of only a year or two ago, 8 yd. then being considered a satisfactory figure.

Recently in Lancashire one machine has yielded over 1,600 tons per day at a face output per manshift of 17 tons. No doubt other coalfields could quote as good, or even better, performances, which shows that once the demand for "large" coal has been met the way is clear for a further jump in efficiency.

On the haulage roads, transport efficiency has improved substantially in recent years. In 1954 transport accounted for 158 manshifts per 1,000 tons; in 1959, the number of shifts per 1,000 tons was down to 128.

Before leaving underground operations* two other developments should be mentioned—namely, the much more rapid sinking of shafts and driving of tunnels now being achieved. Formerly a rate of 40 yd. a month of completed shaft, 18 ft. internal diameter, was considered good, so that a shaft 880 yd. deep took over two years of actual sinking, quite apart from all the preliminary work involved in erecting the headgear and winding engine. Recently, using South African methods, speeds of 100 yd. per month have been attained in shafts of 24 ft. diameter, an increase of four times in the volume of ground excavated and of three and a quarter times in walling.

Similarly, tunnels which were driven at 40 to 60 yd. per month can now be driven 300 to 400 yd. in the same time, thanks to improved drilling and shotfiring techniques and the use of power-operated shovels.

The overall result is that development costs can be held, if not actually reduced, and projects can be brought to fruition so much earlier. On a £10,000,000 colliery a saving of one month means some £50,000 saved in interest charges alone.

* The author dealt briefly also in his paper with hoisting and ventilation. He concluded with some notes on coal preparation.—EDITOR.

Better Coke from High-volatile Gas Coal

METHOD of producing coke of improved quality from high-volatile gas-making coals has been investigated and applied in Australia. Use is made of soft coal ordinarily not suitable for coking. The investigations were carried out in Sydney (New South Wales) by the Coal Research Division of the Australian Commonwealth Scientific and Industrial Research Organization.

LABORATORY WORKERS GUIDE RETORT HOLDING 200 LB. OF CRUSHED COAL CONTAINING 15 PER CENT. CHAR INTO TECHNICAL-SCALE OVEN TO BE CONVERTED TO COKE. TAR, LIQUOR, GAS, AND OTHER BY-PRODUCTS ARE COLLECTED SEPARATELY TO BE ANALYZED AND TESTED. THE GAS-FIRED FURNACE PRODUCES A TEMPERATURE OF 900 DEG. C.

At present, about 4,000,000 tons of coal are carbonized in Australia every year to produce about 3,000,000 tons of metallurgical coke. Each year, however, the demand for coke is rising.

Most Australian coking coals are not the "most suitable" for coke making, and reserves of the highest quality were limited, according to Mr. H. R. Brown, head of the Coal Research Division. "We lack the variety and quality of the better types of coking coals with which some oversea countries are well endowed," he said. "Many Australian coals are high in volatile matter. When carbonized in coke ovens they yield much tar and gas, but the coke yield is rather low. Cokes made from these coals are porous and badly cracked."

Mr. Brown said that they had made many hundreds of coking experiments in technical-scale coke ovens. As a result, they had shown that the coking quality of many Australian coals could be considerably improved. Some of these methods were crushing coal to a certain degree of fineness, adjusting the bulk density of the coal charge, controlling the moisture content, adding oil to the charge, pre-heating, and blending suitable coals or adding specially prepared carbon materials. The last method was one of the best ways of improving coke quality.

"We have found that inert carbon, made by passing powdered coal through a heated retort, is an excellent material for blending with high-volatile coking coals," said Mr. Brown. "The cokes thus produced are very much harder and tougher than those made from the original coals. The effect of blending inert carbon with coal is comparable with the addition of blue metal dust to cement when making concrete."

The blending process cannot be applied to every coal. It can be used only with coals that melt to a thick, tarry paste when heated.

Two non-coking coals cannot be mixed to produce a fused coal,

New Equipment and Products

Efco Junior Closed Quench Furnace

TO provide closed quenching facilities for processing small quantities of work economically, a new junior size furnace has been introduced by the Electric Resistance Furnace Company, Limited, Netherby, Queens Road, Weybridge (Surrey).

Designed for gas carburizing, carbonitriding, and carbon restoration, the furnace incorporates a horizontal heating chamber, a purging chamber, and an oil quench tank, and is fitted at the front with a roller conveyor, charging table. The work, in baskets, is moved into the furnace through an outer door fitted with a gas screen to prevent the ingress of air. Inside the purging chamber the work is supported on a single-deck charge elevator subsequently used to lower the work into the oil quench. The charge is then moved into the heating chamber with a push rod inserted through a hole in the outer door. The door to the heating chamber, the outer door, and the charge elevator are all air operated with control levers mounted on the right hand side of the furnace.

The heating chamber is fitted with radiant tube elements which are arranged for direct connection to a standard three-phase supply. These elements, rated at 15kW, are arranged in a single control zone and provide furnace temperatures up to 950 deg. C. The atmosphere within the chamber is circulated by a fan driven by a water-cooled electric motor mounted on the top of the furnace. The oil quench tank is fitted with an oil cooler and a motor-driven oil agitator. The furnace, which accommodates work baskets 14 in. long by 8 in. wide by 8 in. high, is shown in Fig. 1.

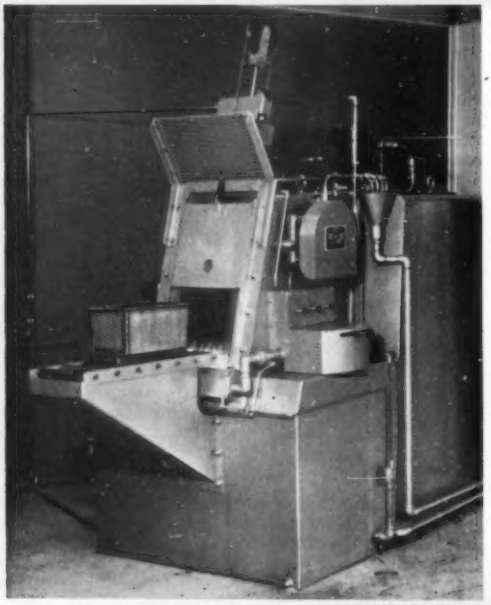


FIG. 1.—EFCO JUNIOR CLOSED QUENCH FURNACE.

Modified Positive Air Blowers

A NUMBER of operating advantages, including improved performance, have resulted from recent modifications to the range of Type RBS Holmes-Connersville positive air blowers, manufactured by W. C. Holmes & Company, Limited, Huddersfield. The impellers and shafts are now of fabricated construction in steel, making it possible to use much larger shafts and bearings, which increase the allowable pressure loading on each size of machine. The maximum pressure for some sizes has been increased from 10 lb. to 15 lb./sq. in.

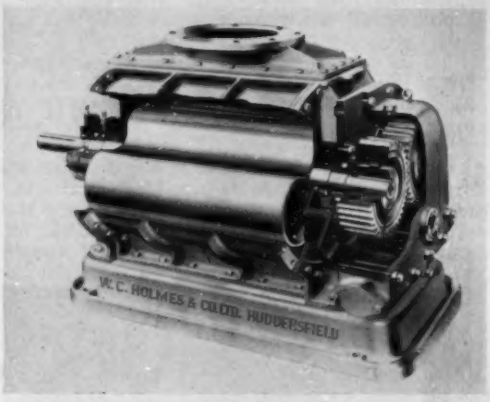


FIG. 2.—CUT-AWAY VIEW OF 10-IN. HOLMES-CONNERSVILLE POSITIVE AIR BLOWER.

Another important advantage is that these blowers are constructed with air gaps which completely isolate the bearing housings and gears from the casing, thus ensuring that in no circumstances, even in the event of an oil seal failure, is it possible for air passing through the blower to become contaminated with oil or oil vapours. When handling gases other than air, these blowers can be fitted with mechanical shaft seals which are considerably more efficient than the stuffing box and gland previously used. The mechanical shaft seal requires little or no attention.

Boiler Feed Pump

THE "SC" Mopump made by Rhodes, Brydon & Youatt, Limited, Reddish Engineering Works, Stockport (Ches), is a further addition to the firm's standard range. It is intended for boiler feed and similar duties, its primary purpose being to meet the demand for "package" boilers.

The main features of the pump include exceptional robustness and the steep quantity curve, a characteristic which makes it especially suitable for boiler feed duties.

It is made with 1-in., 1¼-in., 1½-in., and 2-in. bore branches in single-stage and two-stage units.

New Transit Crane

INTRODUCED by Ruston-Bucyrus, Limited, Lincoln, at the Public Works Exhibition is the 11-RB transit crane of 9 tons capacity mounted on a specially

designed chassis constructed jointly by Atkinsons, Limited, and Ruston-Bucyrus and powered by a Perkins diesel engine of 98 h.p. Road speeds of up to 32.8 m.p.h. are possible.

The machine has a number of new features, such as totally enclosed, pre-lubricated ballbearing swing circle, unit assemblies, nylon pins and bushes in the control linkage, and bolts standardized on two sizes UNF threads. The superstructure is powered by a Ruston 3YDAN diesel engine of 40 h.p., air cooled. The main machinery gears are enclosed and run in oil, and the four main operating clutches are alike in size and type and have single-point adjustment.

FIG. 3.—THE 11-RB TRANSIT CRANE.

All shafts and parts of shafts used in the lifting cycle are mounted on anti-friction bearings. At present the 11-RB is only available as a lifting crane. The range of boom lengths is from 25 ft. to 70 ft. Offset jibs, 10 ft. and 20 ft., are also available.

Preventing Fires at Colliery Refuse Piles

METHODS devised by the US Bureau of Mines for controlling fires in bituminous-coal refuse piles are described in a new report. The report, "Control of Fires in Coal Mine Refuse Piles," covers laboratory and field studies in which research workers demonstrated the effectiveness of fine-coal wastes from washeries when applied in layers as a "sealing" material that inhibits the flow of air through heaps of coal, shale, and other mine refuse. The technique proved useful not only for controlling fires resulting from spontaneous ignition of refuse piles, but also for preventing their occurrence.

Generally, such fires are extremely difficult to control because they eat deeply into refuse dumps and may smoulder for years, beyond the effective reach of water or other extinguishing agents.

Radioisotope Used to Tag Coal in Research

RESEARCH personnel of the Bureau of Mines, US Department of the Interior, are using the radioisotope Gallium-68 to "tag" tiny particles of coal to aid in their studies for finding new and improved uses for coal. Because of its extremely short life, Gallium-68 is proving ideal for use in experimental equipment for creating synthesis gas from coal. This gas can be treated to yield chemicals, gasoline, and pipeline gas. Gallium-68 has a half-life of only 58 min. and loses its radioactivity in a few hours, the bureau comments. Thus, hazards are held to a minimum, no residue remains to contaminate equipment or products of the gasification process, and there is no disposal problem.

The Gallium-68 is made by the bureau from another isotope, Germanium-68. Prepared by solvent extraction, Gallium-68 is in liquid form. A few drops are dried on to a coal sample and the tagged particle is ready for its journey through the gasifier. Its progress is traced readily from the energetic gamma rays it emits and which carry through heavy pipe walls to detecting devices logging its passage. Bureau scientists at the Morgantown, W. Va., Coal Research Centre said the preparation of the gallium isotope from Germanium-68 and the readying of a tagged sample of coal requires only a few minutes.

This makes it possible to introduce the tagged particles on a scheduled basis. The simplicity of preparation and the ease of use enhance the application of Gallium-68 and speed research. The bureau's present source of Germanium-68 is said to be sufficient for several years' supply of gallium radioisotopes for the coal studies at Morgantown.

British Technical Publications in Canada

More than 3,500 leading businessmen and professional men in Canada are receiving regular copies of selected British trade and technical journals under a scheme designed to boost still further Britain's exports to Canada. The scheme has been planned jointly by the Dollar Exports Council and the Periodical Proprietors' Association, whose Trade and Technical Press Council has arranged with its members to send complimentary copies of the journals for periods of up to six months. IRON AND COAL and other journals in the Industrial Newspapers group are among the publications concerned in the scheme.

Forthcoming Events

NOVEMBER 26

Royal Institution of Chartered Surveyors:—Mining surveyors' general meeting at the Welbeck Hotel, Nottingham, at 10.30 a.m. "Offshore Mineral Exploration," by R. H. Garnett.

NOVEMBER 28

Institution of Production Engineers (Sheffield Section):—Meeting at the Grand Hotel, Sheffield, at 6.30 p.m. "Membership Qualifications," by H. W. Hodson.

Institution of Production Engineers (Manchester Section):—Meeting at Manchester College of Science and Technology at 7.15 p.m. "Machine-tool Development as Seen at Olympia, 1960," by N. Stubbs.

Institution of Plant Engineers (West and East Yorkshire Branch):—Meeting at the Houldsworth School of Applied Science Leeds University, at 7.30 p.m. "The Building of a Modern Oil Tanker," by W. S. Brown.

Institution of Mechanical Engineers (Yorkshire Branch):—Afternoon visit to Hepworth & Grandage, Limited, Bradford. Meeting at the Institute of Technology, Bradford, at 7.15 p.m. "Planned Maintenance," by W. Jones.

NOVEMBER 29

Wigan and District Mining and Technical College:—Meeting in the board room at 5 p.m. "Modern Trends in Coal-face Mechanization," by E. J. Daniell, mechanization department, North-Western Divisional Coal Board.

Institute of Engineers and Shipbuilders in Scotland:—Meeting at 39, Elmbank Crescent, Glasgow, C.2, at 6.30 p.m. Discussion on "Does Prefabrication Pay?"

Institution of Electrical Engineers (South-East Scotland Subcentre):—Meeting at the Carlton Hotel, North Bridge, Edinburgh, at 7 p.m. "Submersible Pumping Plant," by H. H. Anderson and W. G. Crawford.

Institution of Mechanical Engineers (South Wales Branch):—Meeting at the South Wales Institute of Engineers, Park Place, Cardiff, at 6 p.m. "The Future of Air-breathing Engines in Aviation," by S. G. Hooker.

NOVEMBER 29-30

Iron and Steel Institute:—Autumn general meeting at Church House, Great Smith Street, London, S.W.1.

NOVEMBER 29-DECEMBER 2

Corrosion and Metal Finishing Exhibition:—At the Empire Hall, Olympia, London.

NOVEMBER 30

Institution of Production Engineers (Shrewsbury Section):—Meeting at Walker Technical College, Oakengates, at 7.30 p.m. "Recent Developments in High Production Foundries," by J. D. Perry.

Society of Instrument Technology (South Wales Section):—Meeting at the Welsh College of Advanced Technology, Cardiff, at 6.45 p.m. "The Application and Selection of Automatic Control Valves," by P. Stone.

DECEMBER 1

Midland Institute of Mining Engineers:—Annual dinner and dance at the Royal Victoria Hotel, Sheffield.

Society of Chemical Industry (Corrosion Group):—Meeting at the Empire Restaurant, Olympia, London, W.14, at (*a*) 2 p.m. and (*b*) 3.45 p.m. "The Influence of Water Movement on Corrosion": (*a*) "Ferrous Materials," by Dr. G. Butler; (*b*) "Non-ferrous Materials," by Dr. N. V. Nowlan.

Institution of Production Engineers (Rochester Graduate Section):—Meeting at the Old Palace, Maidstone, at 7.30 p.m. "Diamond Wheels as Applied to Carbide Tool Production," by J. C. Dawkins.

Mining Institute of Scotland:—Special general meeting at the County Hall, County Buildings, Wellington Square, Ayr, at 6 p.m. Subjects for discussion:—"Some Aspects in the Development of Killoch Colliery" (introduced by G. Gillespie, Group manager, West Ayr Area, Scottish Divisional Coal Board) and "An Experiment in the Production of Large Coal at Kinneil Colliery" (introduced by D. M. Archibald, agent/manager, Kinneil Colliery, Bo'ness).

DECEMBER 2

Junior Institution of Engineers:—Meeting at Pepys House 14, Rochester Row, London, S.W.1, at 7 p.m. Film evening.

DECEMBER 3

North of England Institute of Mining and Mechanical Engineers:—Annual general meeting in the Lecture Theatre, Neville Hall, Westgate Road, Newcastle-upon-Tyne 1, at 2.30 p.m. Presidential address.

DECEMBER 5

Institute of British Foundrymen (Sheffield Branch):—Meeting at the Technical College, Pond Street, Sheffield, at 7 p.m. "Engineering and the Re-layout of a Jobbing Core Shop," by A. Atherton.

North East Coast Institution of Engineers and Shipbuilders:—Meeting at the Mining Institute, Newcastle-upon-Tyne, at 6.15 p.m. "The Effect of Wave Form and Wave Length on Bending Moment," by Prof. J. F. C. Conn and N. S. Miller.

North Staffordshire Institute of Mining Engineers:—"Alternative Ventilation Schemes for a Reconstructed Colliery," by R. R. Kirk.

Institution of Mechanical Engineers (North Eastern Branch):—Meeting at Neville Hall, Westgate Road, Newcastle-upon-Tyne 1, at 6 p.m. "The Diesel Engine in Association with the Gas Turbine," by E. Chatterton.

DECEMBER 6

Institution of Chemical Engineers:—Meeting at the Geological Society, Burlington House, London, W.1, at 5.30 p.m. "Study on Electro-precipitator Performance in Relation to Particle Size Distribution, Level of Collection Efficiency, and Power Input," by D. O. Heinrich.

Institution of Production Engineers (Halifax and Huddersfield Section):—Meeting at the Percival Whitley College of Further Education, Francis Street, Halifax, at 7.30 p.m. "The Function of Modern Inspection," by A. C. J. Surman.

Institution of Production Engineers (Tees-side Section):—Meeting at the College of Further Education, Cleveland Avenue, Darlington, at 7 p.m. "The Meaning of Effective Communication in an Industrial Organization," by A. C. Leyton.

Institution of Production Engineers (Peterborough Section):—Joint meeting with the Institution of Plant Engineers at the White Lion Hotel, Church Street, Peterborough, at 7.30 p.m. "Chemical Engineering" by J. C. Veale.

Institution of Production Engineers (Oxford Section):—Meeting at the Town Hall, Oxford, at 7.30 p.m. "Non-destructive Testing as an Aid to Production," by D. G. W. Claydon.

Institution of Electrical Engineers (North-Western Utilization Group):—Meeting at the Engineers' Club, Albert Square, Manchester, at 6.15 p.m. "Electrical Characteristics of the Argon Arc Welding Process," by J. C. Needham and Dr. L. H. Orton.

National Association of Colliery Managers

NOVEMBER 28

Midland Branch:—Meeting at the Denman's Head Hotel, Sutton-in-Ashfield, at 6.30 p.m. "Control of Mine Ventilation," by G. A. Percival, ventilation engineer, No. 4 Area, East Midlands Divisional Coal Board.

NOVEMBER 29

South Wales Branch:—Meeting at the Welsh College of Advanced Technology, Cardiff, at 6 p.m. "Some Problems Associated with Mechanization in the South-Western Division," by G. V. Standerline mechanization engineer, South-Western Divisional Coal Board.

DECEMBER 5

South Midland Branch:—Visit to Cadley Hill Colliery and paper on "Reconstruction at Cadley Hill," by J. R. Gibson.

DECEMBER 8

South Staffordshire, Warwickshire, Worcestershire, and Shropshire Branch:—Meeting.

DECEMBER 13

Yorkshire Branch:—Meeting at the Miners' Welfare Hall, Brodsworth, at 3 p.m. "Coal Ploughing in the Beeston Seam at St. John's Colliery," by B. Hatherton, C. Meryett, and A. S. Harris.

DECEMBER 19

Midland Branch:—Meeting at the Denman's Head Hotel, Sutton-in-Ashfield, at 6.30 p.m. Paper by F. Turton, manager of Silverhill Colliery.

IRON-ORE MINING AT KIRUNA

Switch from Open-cast to Underground Methods

By S. BRAND

ATLAS COPCO T4G AUTOLOADER.

Kiruna iron-ore mine in the north of Sweden is located about 90 miles north of the Arctic Circle and approximately 1,600 ft. above sea level. The orebody is about four and a half miles long and has an average thickness of some 300 ft. Hitherto, open-cast mining has been carried out, but the switch over to underground mining is at present in progress and the open-cast operations should be entirely finished within the next two to three years.

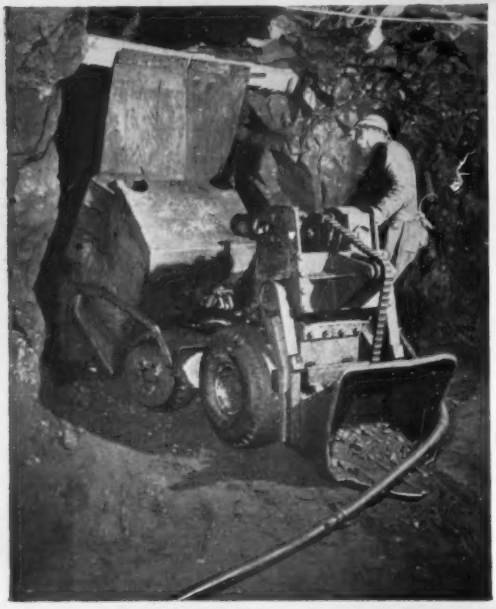
CONSIDERABLE changes in the machinery employed are, of course, entailed in the switch over from open-cast mining to underground mining. Thus, smaller machines than those used in the open-case must be procured. This applies to rock-drilling equipment and loaders as well as transportation vehicles. Different types have been, and are being tested. At some of the extensive development work, caused by the switch over from open to underground mining, Atlas Copco autoloaders, mounted on pneumatic tyres, types T2G and T4G, have been used to advantage during the last two years.

The autoloaders have been principally employed for mucking in smaller excavations, such as workshops, stores, crusher stations, etc., for mucking in short tunnels and, more particularly, in connection with level attack at shaft sinking.

At some of the service accommodations, such as workshops, stores, etc., mainly scraper units and trackbound shovelloaders were earlier used for mucking. When the compartments are of a more rectangular shape the trackbound transportation is a relatively cheap mucking method. When the excavations are more widely ramified the trackbound transportation becomes, however, more unfavourable and for this reason tests have begun with the trackless autoloaders which have been introduced by Atlas Copco. The widths of the rock chambers have varied from 10 to 30 ft. and the heights from 8 ft. upwards. Dumping has taken place into shafts or on to conveyor belts which, in their turn, have dumped the rock in trackbound cars. The haulage distance has varied from 10 ft. to 230 ft.

An operation for which the light trackless autoloaders are particularly useful in collaring and tunnelling in connection with shaft sinking. Fairly extensive shaft-sinking operations are in progress in Kiruna.

It can be mentioned that for the planned underground mining 10 or 11 shafts are estimated to be required for the ore hoisting alone. The major part of the hoisting is concentrated to the central dressing plant where 10 shafts are at present being made. These shafts are driven as follow:—From a so-called "auxiliary shaft" at vertical intervals of 160 ft., 400-ft. long drifts are driven towards the shaft position. After that the shafts are driven as raises. In the small drifts, 10 ft. by



ATLAS COPCO T2G AUTOLOADER.

10 ft. from the "auxiliary shaft" the autoloader T2G has proved to be suitable. It has even been possible to empty the autoloader directly into the "barrel" for the rock hoisting without any extra arrangement.

Earlier the scraper-loading methods were employed when a drift was started from an "auxiliary shaft" and trackbound loaders and cars were used when sufficient space was obtained for the loading and transportation units. Now the intention is to utilize the above mentioned autoloaders for the complete tunnelling and for the mucking and transportation of all rock from the 10 raises. The advantage of these trackless autoloaders as compared with scraper loading is that the mucking efficiency does not drop so quickly in relation to the distance as is the case with the scraper method. In comparison with the trackbound loading and transportation system, the advantage is gained that there is no need to burden the relatively small hoisting arrangements still further with rail and timber transports as well as the saving of the increased carrying of personnel which the building constructions would entail.

It is not yet possible to give any definite figures in respect of the capacities and costs of the above-mentioned autoloaders. The employment of the machines has not yet been such that any unusual outputs have been recorded. It can be mentioned, however, that in connection with time-and-motion studies a shift output of 110 tons for T2G and 150 tons for T4G has been obtained. The figures include a haulage distance of 160 ft. one way and apply to rock of 2 ton/cu. yd. of solid rock. With an experienced operator 195 tons and 245 tons, over a haulage distance of 75 ft. and 100 ft., respectively, have been reached. These shift periods include about 1.5 hr. for going to and from the working place as well as other lost time.

Tyre wear has so far been a relatively high cost item. But when the operators have attained more experience and more care has been paid to the floor it should be possible to lower these costs to a reasonable level.

METALLURGY OF BERYLLIUM

INTERNATIONAL conference on "The Metallurgy of Beryllium," organized by the Nuclear Energy Committee of the Institute of Metals, is to be held in London on October 16, 17, and 18 of next year.

The intention is to publish and discuss a mass of hitherto unpublished original work on beryllium and to cover metal fabrication, physical and mechanical properties, and metal physics—in fact, the whole field of the metallurgy of beryllium with the exception of extraction processes.

The organizing committee invites offers of original papers for the conference and requests that prospective authors shall submit firm titles and synopses of their papers by January 1 and the final manuscripts, in duplicate, not later than April 1. Prospective authors are asked to advise the secretary, as soon as possible, of the topics on which they intend to offer papers. Papers will be issued in preprint form in advance of the conference and will later be published, together with reports of the discussions, in bound form.

Correspondence regarding the conference should be addressed to the Secretary, Institute of Metals, 17, Belgrave Square, London, S.W.1.

Census of Production for 1960

Census of production to be taken in 1961 for the year 1960 will be a sample inquiry and the questions asked will relate only to the total value of goods sold and work done, stocks, and capital expenditure. Undertakings producing coal, gas, electricity, oil shale, crude or refined petroleum, or shale oil products are exempted from making census of production returns.

Training of Graduates

Revised edition of the report on "The Training of Graduates," prepared by the Joint Committee on Practical Training in the Electrical Engineering Industry, is available from the secretary of the Institution of Electrical Engineers, Savoy Place, London, W.C.2 (2s. 6d., post free). The report reaffirms the belief in the three-point plan of basic workshop training, general mechanical and electrical training, and directed objective training, and an endeavour has also been made to outline the underlying purpose of the training period in the broader sense.

250-ton Crane for Canada

Loco Re-railer for Ore-carrying Railroad

FACING stiff American competition, Cowans, Sheldon & Company, Limited, Carlisle, was awarded a contract at the beginning of the year for two large diesel railroad wrecking cranes for the newly formed Quebec Cartier Mining Company, owned by the United States Steel Corporation, Pittsburgh. The larger of the two cranes is of diesel-hydraulic design, mounted on a six-axle, double-bogie carriage and equipped with main, auxiliary, and whip hoists for use on 4-ft. 8½-in. gauge tracks.

Designed primarily for railroad wrecking service in Arctic temperatures down to minus 60 deg. F., the crane is constructed within a loading gauge of 15 ft. 3 in. high by 10 ft. 6 in. wide and is capable of negotiating curves of 150 ft. minimum radius.

The maximum axle load when the crane is in motion with the lifting blocks supported on a matchtruck is 68,000 lb., while the maximum lifting capacity on the main hook with outriggers set is 500,000 lb. at 17 ft. 6 in. radius. This performance is claimed to be equal to that of any wrecking crane yet built. Minimum reserve stability is 17 per cent., length over headstocks is 36 ft. 7¼ in., coupled length is 40 ft., and axles are spaced at 5 ft. within the bogies.

Fitted with a Rolls-Royce six-cylinder vertical liquid-cooled supercharged oil engine, rated at 255 b.h.p. at 1,800 r.p.m., the crane will lift 500,000 lb., at 5½ ft./min., 112,000 lb. at 30 ft./min. on the auxiliary hoist, and, on the whip, 289,000 lb. at 130 ft./min. The full load may be slewed through 360 deg. in 2 min. and also the jib may be derricked-in from running height to minimum radius in approximately 2 min. Rated loads are derricked from maximum to minimum radius at 15 ft./min., while the crane will travel with a suspended load of 86,000 lb. up a 2½ per cent. gradient at 150 ft./min., or on the level at 300 ft./min.

The crane is equipped with two 100-W floodlights at the jib head, two 250-W floodlights on the front of the superstructure, two 250-W tail lamps, five 50-W cab lights, and two 30-W inspection lamps. These are supplied from an auxiliary generator, and, in addition, a 2-kW power supply is available for external use.

A comprehensive range of tackle, supplied with the crane, includes a lifting beam, single and two-leg wire rope slings of various lengths and capacities, and shackles of various sizes.

This 250-ton crane, completely designed, built, and tested in nine months, will be used to re-rail locomotives and rolling stock on the 190-mile railroad being built to carry iron ore from the mines at Lac Jeannine in the hinterland of Northern Quebec Province to the newly constructed Port Cartier.

This 250-ton crane and the smaller 150-ton one, which is still under construction and is due for despatch in March, 1961, are the only two major items of equipment for this multi-million dollar project ordered outside the North American continent and will earn Britain almost $500,000.

A PROVISIONAL PROGRAMME has been issued for the first International Congress on Metallic Corrosion, to be held at the Imperial College of Science and Technology, London, from April 10 to 15, 1961.

THE 250-TON DIESEL RAILWAY BREAKDOWN CRANE FOR THE QUEBEC CARTIER MINING COMPANY.

Boiler Feedwater Treatment

WATER softening consists in the removal of, or reduction of, calcium and magnesium salts in water. In industry, two methods of water softening are commonly employed using lime treatment or one of two forms of ion exchange. In suitable circumstances lime treatment and base exchange, the most usual form of ion exchange, can be incorporated into a single plant.

In a paper entitled "Water Softening for Industrial and Public Supply Purposes," given at the first Effluent and Water Treatment Convention in October by Mr. W. M. T. Boby, the treatment of boiler feedwater for low-pressure boilers operating between 120 and 700 lb./sq. in. is outlined.

Although low-pressure boilers require fairly simple water treatment, it is important that all, or most, of the hardness is removed. This can be achieved by the lime-soda process or by the base exchange process when this is suitable. The main factor governing the suitability of the base exchange process for boiler feed is the alkalinity of the raw water. When the water containing a high proportion of sodium bicarbonate decomposes to caustic soda and sodium carbonate, free CO_2 is evolved in the steam. Although the presence of CO_2 does not cause corrosion in boilers operating in the pressure range from 120 to 700 lb./sq. in., if the steam system involves any return condensate, the CO_2 re-dissolves in the condensate producing a very corrosive water.

The tendency to form free CO_2 in the steam can, to some extent, be arrested by the addition of caustic soda in the feedwater after base exchange treatment. There is, however, a limit to the amount of alkalinity which can be tolerated in any boiler. Priming and foaming occurs as a result of high alkalinities and in riveted boilers the caustic alkalinity can be the cause of what is known as caustic embrittlement or caustic cracking.

In low-pressure boilers, where the alkalinity of the raw feedwater is too high for the base exchange process to be suitable even if caustic soda is added, the lime-soda process can be used. The treated feedwater is best used at a temperature of 140 deg. F., although higher temperatures are frequently encountered. Where steam is being discharged to waste because of its unsuitability for further use, it can often be used to heat the water in a hot lime-soda process. Also, continuous blowdown equipment is often found to be economical because it enables the blowdown to be passed through a heat exchanger where the heat from it is recovered and used to heat the softener.

VENEZUELAN EXPORTS of iron ore to the USA in the first half of 1960 amounted to 8,000,000 tons, compared with 6,300,000 tons in the corresponding period of 1959.

METALLURGICAL COAL FINDS IN INDIA

PROBLEMS associated with the expansion of the Indian steel industry due to limited resources of metallurgical coal will be greatly eased by the discovery of three new rich deposits in the Bokaro and Raniganj areas. "We have yet to prove the quantitative and qualitative dimensions of the new deposits," said Mr. K. D. Malaviya, Minister for Oil and Mines, "but the discoveries seem to be very significant." The fourth steel plant to be set up in India would get its metallurgical coal from "within a stone's throw."

The deposits were located by the Geological Society of India by detailed surface mapping and sample drilling.

In Bokaro, coal having a coking index ranging from between 21 and 23 per cent. has been discovered in an entirely new 74-ft. seam, broken up into two portions separated by 8 ft. of non-coal material. The other deposit in the region relates to the coal seams which were being worked at 2,000 ft. Investigations have shown that the seam at places runs upwards to the 1,000-ft. level, which would make it possible to exploit the seam at considerably lower costs by mining at a lesser depth. The third discovery at Raniganj is of coal almost on the surface, extending over one and a half miles.

Reorganization of West Pakistan Coal Industry

PLANS for the complete reorganization of the coal-mining industry in West Pakistan have been prepared by the Pakistan Industrial Development Corporation. The estimated cost of the plan is Rs. 70,000,000, on which the foreign exchange component will be Rs. 50,000,000, to be used mainly for importing modern machinery and mechanized equipment. Coal consumption in Pakistan is about 2,200,000 tons a year, of which 1,500,000 tons are imported from India and other countries.

Investigations have revealed that West Pakistan contains large coal deposits, which, properly developed, are capable of meeting the full needs of the country. The Sor range in former Baluchistan alone is supposed to have 1,060 square miles of coal-bearing area.

PHOENIX-RHEINROHR will have produced about 3,000,000 tons of crude steel in the year ending September 30, a Düsseldorf report states. Development projects planned for next year include a fourth converter in the new basic-Bessemer plant at Ruhrort and modernization of the finishing mills there. A five-year development plan envisages construction of two further blast furnaces, installation of a fifth converter at Ruhrort, and expansion of heavy plate production at the Thyssen works (Mülheim) to 50,000 tons per month.

Metallurgical Progress

Some abstracts from recent reports on research and development, at home and abroad

How Boron Affects Corrosion of Type 304 Stainless Steel. J. W. FARRELL and P. C. ROSENTHAL. (Metal Progress, 1960, Vol. 77, No. 2, pp. 101-3). This work was undertaken to determine if boron additions would have an effect on the corrosion-resistance of AISI Type 304 18-8 stainless steel in the wrought condition. The investigation included three heats of steel, with 0.0007, 0.0037, and 0.0063 per cent. of boron, respectively, and one heat with no boron. Six of the seven specimens tested from each heat were soaked for 2 hr. in the range of 540 to 815 deg. C., after solution-treatment and quenching. The seventh specimen was solution-treated and water-quenched only. The specimens were exposed to boiling 65 per cent. nitric acid in order to test the susceptibility to intergranular corrosion. All the heats containing boron were attacked at a rate higher than 0.002 in. penetration per month. It is assumed that the initial boron atoms enter sites near lattice imperfections of suitable atomic spacing, so lowering the energy peaks in these areas. The rate of attack decreased as the boron content was raised from 0 to 0.007 per cent., but at contents in the range 0.0037 per cent., the corrosion rate increased. At boron contents higher than 0.0037 per cent., the corrosion rate fell rapidly again.

The Spot-welding of Carbon Steels. I. W. JOHNSON. (Welding Journal, 1960, Vol. 39, No. 3, pp. 89-96). This report summarizes all the available data on the spot-welding of carbon steels. Primarily spot-welding differs from the other welding processes in view of the greater speed in reaching the welding temperature and the rapid cooling of the weld and the adjacent heat-affected zone. There are no difficult metallurgical problems in spot-welding carbon steel, but it was found that an increase in the carbon content into the medium-carbon range (0.30 to 0.45 per cent.) necessitates post heat-treatment. The tensile-shear strength varies directly with the diameter of the spot-weld at the interface, and a rough calculation can be made, based on the area of the interface and the strength of the material in the annealed state. Cleaning before welding ensures uniform surface conditions and improves the consistency of the welds. Fatigue failures start at the interface and are not noticeable until complete failure is about to occur. The fatigue strength of spot-welds is inherently low, this being a mechanical phenomenon. There are no totally reliable non-destructive tests for spot-welds, but the peel test offers the most effective single test.

Converters May Increase the Use of Electric Soaking Pits. ANON. (Steel, 1960, Vol. 146, No. 21, pp. 138-40). Coke-lined refractory troughs are used as resistance-heating elements in the pits, most of the heat being transmitted to the ingots by radiation. Electrodes passing through the end walls, carry power from a transformer bank to the heaters. There are four basic types of pits, namely: (1) A single-heating element through the centre, ingots being placed in compartments on both sides of the resistor; (2) the double pit with resistors on each side and a solid partition in the centre; (3) three-resistor pit, with heating elements mounted on each side of the chamber, a third passing through the centre; (4) two-resistor pit, where the heat is applied from two elements (along the side walls) to a single row of ingots in the middle. The automatic controls and resistance heaters ensure uniform temperatures in the pits, and the atmosphere can be controlled easily. No scale is formed on the ingots unless air is introduced for that purpose. The normal power consumption in an electric pit, charged with hot ingots, is about 22 kW.-hr. per ton of ingots.

Collapsible Umbrella Mould Used to Make Hot Tops. ANON. (Steel, 1960, Vol. 147, No. 1, pp. 76-8). A chemical bonding of sand rammed in a collapsible metal mould is said to give high-quality refractory hot tops at a reasonable cost per ton of steel poured. Sand is wetted with 4 to 7 per cent. sodium silicate in a muller, and then is rammed into the mould. Carbon dioxide is passed through the packed material for 20 to 40 sec. The gas reacts with the sodium-silicate solution, silica being precipitated as a gel, causing immediate setting and giving a rigid structure. A sheet-metal umbrella, supported by four tubular legs, is positioned on top of the ingot mould. The legs of the umbrella are set at the right height to hold it in the mould. The hot-top mix, carried to the mould by crane, is poured around the umbrella, and tamped lightly. After gassing and the collapse of the umbrella, the hot top can be used immediately.

Ultrasonic Cleaning and Pickling. H. F. OSTERMAN and A. V. SANTA LUCIA. (Metal Progress, 1960, Vol. 78, No. 2, pp. 110-114). To demonstrate the potential of ultrasonic cleaning and pickling, the authors constructed a working model of a bar pickler, capable of pickling bars up to 1¼ in. dia. and about 1 ft. long. The bars are carried through the pickling bath along a fixed pass line. Above and below the line are transducers which agitate the solution around the bars, so increasing the pickling rate, and, at the same time, removing pickling residues. A graph shows the effect of temperature on ultrasonic-pickling time of hot-rolled grade 1010 bar stock at acid concentrations of 5, 10, and 15 per cent. (by weight). The effect is similar in nature to decreases in pickling time

with increasing temperature which occur in acid without ultrasonics. At an acid concentration of 9.75 per cent., it requires 18 min. to descale completely 1010 steel, while with ultrasonics it takes 108 sec.

The build-up of ferrous sulphate in the bath increases the pickling time. Experiments indicate that a higher ferrous-sulphate concentration can be tolerated when ultrasonics are used. The addition of Rodine 92 inhibitor to the pickling bath has two distinct results, namely, surface roughness of the pickled material is decreased due to lack of acid attack on the base metal, and the ultrasonic pickling time is reduced. A number of specimens were checked for cleanliness, showing higher cleanliness ratings. The difference indicates that most reaction products are removed by ultrasonic action as they are formed.

The Stora-Kaldo Oxygen Steelmaking Process. G. J. McMANUS. (Iron Age, 1960, Vol. 185, No. 26, p. 111). Two 110-ton vessels of the Stora-Kaldo type have been put into service at Sollac, France, and results to date show them to be most satisfactory. The vessels are being used to make deep-drawing steels. Starting with high-phosphorus ores, the units have produced ingots of 0.015 per cent. phosphorus, or less. Also, low nitrogen and sulphur contents are reported. In this process, carbon is fully oxidized rather than passing off as carbon monoxide. It has been contended that this feature makes extra heat available for melting scrap.

Sollac has been using about 40 per cent. scrap plus some iron ore, obtaining ingot yields averaging over 90 per cent. The vessel rotates on its longitudinal axis during the oxygen blow. Some steelmakers are a little diffident about 100 tons of iron and scrap being put in a vessel and rotated at speeds up to 30 revs./min. Sollac has produced heats up to 122 tons and there have been no signs of serious structural problems. The refractory wear has not been tested at Sollac, but it is claimed that the refractory consumption is at the rate of 24 lb. per ton of steel. One effect of an increase in vessel size has been to speed up the reactions. The larger diameter of the Sollac vessels has given greater speed at the outer walls, resulting in a faster evolution of gas.

A Vacuum Furnace Which Brazes Parts at Temperatures Up to 2,480 Deg. C. M. SCHWARTZ. (Iron Age, 1960, Vol. 185, No. 22, pp. 68-70). Designed for sintering, brazing, heat treating, and annealing, a new resistance-type furnace operates at temperatures up to 2,480 deg. C., with pressures in the 0.1-micron range. The internal-element vacuum furnace has no non-metallic refractories inside the chamber, metal shields controlling the heat loss. Small mass and low specific heat of all the internal parts allow fast heating and cooling. A saturable core reactor provides the power control, and thermocouples help to maintain the temperature. The chamber, which is 34 in. long, opens on either end of the shell. The horizontal stainless steel inner chamber has a stainless steel water jacket.

Tantalum, in strip form, serves as the heating elements, and they operate on a low voltage. Closely spaced corrugated and serpentine-shaped heating elements hold radiation and conduction losses to a minimum. All the radiation shields are arranged in packs. Each assembly consists of three tantalum and three molybdenum shields. No more than 135 kW. has been needed to operate the furnace. A minimum water pressure of 40 lb./sq. in., and a temperature of 15 to 30 deg. C. are used.

An Improved Micro-hardness Tester for High-temperature Use. J. H. WESTBROOK. (A.S.T.M. Bulletin, 1960, No. 246, pp. 53-8). The author describes the design, construction, and operation of an improved high-temperature, micro-hardness tester. This has a temperature range of −190 to +1,500 deg. C., a load range of 5 to 1,000 grams, a rate of loading of 0.2 to 1.2 mm. per min., and a time of indentation of 2 to 60 sec. There is a marked improvement in the method of loading.

A motor-drive raises the specimen against a deadweight loaded indenter which is mounted on a counter-balanced beam. There are vacuum locks at both the entrance and exit ports, so the specimen can be inserted and removed with the chamber pumped down and at temperature. The indenting operation is fully automatic, as there are a series of contacts, relays, and timers. The specimen is put through the entrance port and vacuum lock and is lowered on to the entrance chute, and a push-rod moves it into the chamber. With a fine screw adjustment the specimen can be positioned to ±0.0001 in. in the test chamber. After heating the specimen to the required temperature, a loading weight, from a set of six within the vacuum chamber, makes a series of indentations, the specimen being advanced a small distance after each indentation. The specimen is pushed out through the exit chute into an extraction chamber and the vacuum lock is closed. The specimen is extracted in a few minutes, and then the indentations can be measured with a microscope equipped with a filar eyepiece.

A further design feature of the tester is a number of large viewing ports for observation of the operation of the components.

---

78 Papers from 17 Countries

Proceedings of the International Clean Air Conference, held in London a year ago, have been published by the National Society for Clean Air, Field House, Breams Buildings, London, E.C.4, price 30s. (32s. 6d. by post). The volume contains the 78 papers, from 17 countries, that were presented. Grouped according to subject, the papers in each session were reviewed by a rapporteur, and these reviews, together with the general discussions that followed, are also recorded in the book. The conference (with a clean air exhibition) was organized by the society to celebrate the diamond jubilee of its foundation.

ACCIDENTS AT MINES

Some Avoidable Instances

BRIEF accounts based on receipts of HM inspectors of Mines draw attention to some of the fatal accidents which might have been avoided during the half-year ended October 1.

A coal-cutter man erecting supports which had been removed as the machine had been turned from the ribside to the face was fatally injured when struck by a coal-cutter jib which swung suddenly into the goaf from a position over and in line with the machine. Immediately before the accident the leading operator at the controls had engaged the cutting chain and applied power momentarily to move the chain for pick changing and as he did this the jib swung round violently. A locking mechanism was available, and in order, for locking the jib in the parked position over the body of the machine, but the machineman had not made use of this mechanism.

A bargain man was about to set a strap in front of an old, completely closed bord room on a longwall face extracting old pillars, when he was fatally injured by a fall of stone from the broken roof which reeled out another strap standing on a single hydraulic prop. This accident would have been avoided by the better use of supports to give stability and concentration of support in the disturbed area.

Fell Off Stage Scaffold

Five experienced repairers, employed by a firm of contractors, were carrying out repairs on the brick lining of an upcast shaft when one of them fell off the stage scaffold to the bottom of the shaft, a distance of 65 ft., and was killed. If he had worn his safety harness, which was found anchored to a suspension bracket at the side of the shaft near to where he was working, there might not have been an accident.

While fixing a piece of rubber belting on the floor to make a shovelling base, a ripper was fatally injured by a fall of stone from the edge of a ripping at the roadhead of a longwall face. Ten minutes before the accident the two hardwood chocks under the ends of the lip bar had been removed, leaving it supported by only two wooden props, and this girder was reeled out by the fall. The accident would not have occurred if the belting had been fixed before the chocks under the lip bar had been disturbed.

An experienced repairer and a datal hand were cleaning up on a 2.5-m.p.h. endless over-rope. During a momentary stoppage of the haulage the repairer commenced to fill debris into the first tub of an empty set when the rope restarted. He was knocked by the empties into the track of an approaching full set and killed before his companion could stop the rope. Had the repairer himself stopped the haulage and applied the appropriate "block" signal, the accident would not have occurred.

A packer had partly built a waste pack on a machine-cut conveyor face when he unwisely ventured into an adjacent waste for 2 ft. beyond the last row of supports to obtain packing material. He was struck and killed by a large stone. Plenty of material was available between the pack and the face in the form of inferior coal and stone.

In a modern pit bottom two full mine cars became derailed on an elevating creeper and, after the inbye cars had been pole-shunted back up a slight gradient as the first stage in obtaining clearance at the derailment, attempts were made to re-rail the two cars when the others ran away. A deputy who was assisting in the re-railing was crushed and killed. The shunted cars had not been properly secured as the wooden wedges placed under the wheels of the front car had split and so allowed the run-away.

A deputy and a shotfirer were illegally riding on a supplies bogie being hauled up a steep raise by a single-drum, single-speed, electrically driven haulage, when the engineman had difficulty in stopping the bogie at a landing and suddenly applied the brake. The two men were thrown off the bogie; the deputy managed to grasp a support, but the shotfirer was killed after falling a distance of 175 ft. Man-riding was prohibited by the transport rules and by notices prominently displayed; nevertheless, the deputy had instructed the engineman to wind them up the raise.

On a secondary direct-rope haulage plane dipping outbye, a rope attendant was killed when he was crushed between two steel arch supports at the entrance to the refuge hole in which he was standing. The inbye steel arch was ploughed forward by two trams of a full journey, which derailed while running into a double parting. The roadway was crushed, but the standard height and width was maintained. Had the steel arch roadway supports been strutted and the refuge hole supported inside, the accident might have been avoided.

A collier in a conveyor face, after advancing link-bar supports in cantilever, was filling coal left from the previous shift on to the conveyor when a fall of roof occurred. This broke down between the supports, spreading apart two adjacent lines of linked bars, and leaving a cavity which revealed a series of transverse, sloping, dry, and crumbling joint planes. The collier was pinned down by a large stone and killed. Local weak roof conditions prevailed in the area; the accident might have been avoided if such conditions had been appreciated and additional supports set.

On a well-lit haulage roadway a dataller was using a Sylvester to re-rail a tub of dirt when the tub overturned, crushed him against the side, and killed him. The accident might not have happened had he taken up a position on the other side of the Sylvester chain where he would have been clear of the tub.

Crossed a Trunk Conveyor

A ripper walking to his working place crossed over a stationary cable-belt conveyor installed in a road near a transfer point provided with fluorescent lighting. As he was crossing, the trunk conveyor started and both his legs were drawn between a side skirting plate of the transfer point structure and the belt. He sustained injuries to both legs, which had to be amputated. He died a few days later. A bridge specially constructed for crossing the conveyor was available

near the transfer point and notices were posted conspicuously in the district requesting that this bridge should be used at all times when crossing the trunk conveyor.

On a single-unit advancing conveyor face in a hand-got seam where the disturbed clod roof had fallen, a faceworker was killed by a fall of sandstone, which came away from a known roll in the roof and displaced a single prop and bar which had been party supporting it. The ground on each side of the fall was very disturbed and required additional support. If this had been provided the accident might not have happened.

A haulage hand, uncoupling two full tubs gravitating in a pit-bottom siding which was provided with mains lighting, was killed when his head was crushed between the tubs as they bumped into others which were held on a tub stop. The use of the uncoupling hook which was provided would have avoided the accident and the injury might have been less serious had he been wearing a safety helmet instead of a cloth cap.

A timberman was preparing to set a bar behind the power-loader on a longwall advancing face with a shale roof supported by "W" section bars set on hydraulic props when a large stone fell from the roof and killed him. The stone dislodged two adjacent bars, the nearest being 6 ft. 6 in. behind the machine. The accident might have been avoided had temporary supports been set in accordance with the Support Rules.

A tub of sand, which was being trammed along an undulating underground roadway, was halted and held by one man while another man went to fetch a locker. The man holding the tub lost control and the tub ran away and struck a safety officer, who was killed. If a locker (or suitable contrivance) had been used to control the tub in the first place, the accident might not have occurred.

BORN IN A BATH-TUB

SOME of the most interesting "shots" in a new industrial film, "The Steetley Story," are those illustrating the sea-water magnesia plant at Hartlepool. Here is produced refractory magnesia from dolomite (magnesian limestone) and sea-water, a process which was pioneered by the Steetley Company, Limited, Worksop (Notts), in the late 1930s—from an experiment made in the laboratory using an ordinary bath-tub and a 6-ft. tube as a miniature rotary kiln.

The Hartlepool plant is the only one of its kind in the United Kingdom, and is also the largest in the world, despite the substantial works subsequently built in the United States.

"The Steetley Story" is a film about refractories, and because the story involves the activities of a British firm, the largest producer of refractory materials in western Europe and the Commonwealth, it is also a film about the Steetley Company. The refractories field of application is widespread, ranging from the simple firebrick found in every household fireplace, to the vital materials used in earth satellites and atomic power plants, but the most universal application is in the lining of steel furnaces, and this is featured fully in the film.

A tour is made of some of Steetley's many plants in this country and in Canada. In addition to refractory materials, the Canadian subsidiaries quarry dolomite stone for many purposes. The film, in 16 mm. or 35 mm., is available for loan.

Protective Coating of Heavy Equipment

FOR the application of a comprehensive range of anti-corrosive and protective coatings to heavy equipment up to 5 tons in weight, under factory conditions, an industrial service has been established in Manchester. The new service is based on specialized plant installed at Norton Street, Miles Platting, by West's-Loyne, Limited, a company jointly formed by W.G.I., Limited (West's group of industries), engineers, of Manchester, and Loyne, Limited, protective coating specialists, of Ashton-under-Lyne.

The plant, which is adjacent to the main works of the West's group, includes one of the largest fully automatic shotblasting cabinets installed in Britain for this kind of work and a large gas-fired furnace for the sintering and stoving of coatings, or the heat-treatment of metals. The installation is complete with modern preparation and coating equipment and the necessary cranes for the moving of large items while under treatment.

Both powder and wire metal spray guns are used for flame spraying zinc, aluminium, and stainless steel as well as for various synthetic coatings. Pipes and ducting can be internally coated by spray or flow coating. West's-Loyne, Limited, being associated with the West's group, will draw upon the engineering experience of the group companies, which operate in a number of different fields.

Colliery Accidents

FATALITIES caused by accidents at mines under the Mines and Quarries Act, 1954, in the third quarter of this year totalled 61, compared with 121 in the second quarter and 94 in the third quarter of 1959. The number of persons seriously injured was 306, compared with 382 in the second quarter and 376 in the third quarter of last year. Details are given in the following table:—

	Number of persons killed during the 13 weeks ended:		Number of persons seriously injured during the 13 weeks ended:	
	Oct. 3, 1959.	Oct. 1, 1960.	Oct. 3, 1959.	Oct. 1, 1960.
Underground—				
Explosions of firedamp or coal dust	3	4	1	6
Falls of ground ..	22	25	162	134
Haulage	14	16	95	86
Miscellaneous (including shaft accidents) ..	55*	10	75	52
Total	94	55	333	278
Surface—				
All causes	—	6	43	28
Total underground and surface	94	61	376	306

* Includes 47 persons killed in the disaster at Auchengeich Colliery (Lanarkshire) on September 18, 1959.

Pig-iron and Steel Production

IN the following United Kingdom pig-iron and steel statistics, issued jointly by the Iron and Steel Board and the British Iron and Steel Federation, Table 1 gives the production of pig-iron and ferro-alloys and the number of furnaces in blast in September. Table 2 gives the production of steel ingots and castings in September and Table 3 gives details of finished steel in August last. Activities of the industry are summarized in Table 4.

TABLE 1.—*Weekly Average Production of Pig-iron and Ferro-alloys in September*, 1960. (*Thousands of Tons.*)

District.	Furnaces in blast.	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derbys, Leics, Notts, Northants, and Essex ..	21	—	31.2	18.9	0.1	—	50.2
Lancashire (excl. N.W. Coast), Denbighs, Flints, and Cheshire ..	7	—	24.9	—	—	1.6	26.5
Yorks (excl. N.-E. Coast and Sheffield)	—	—	—	—	—	—	—
Lincolnshire ..	10	—	47.6	—	—	—	47.6
North-East Coast	18	2.2	64.2	—	—	1.4	67.8
Scotland	7	0.3	24.5	1.5	—	—	26.3
Staffs, Shrops, Worcs, and Warwicks ..	5	—	10.1	1.1	—	—	11.2
S. Wales and Monmouthshire	10	2.8	50.9	0.4	—	—	54.1
Sheffield	2	—	3.0	—	—	—	3.0
North-West Coast	7	16.2	—	1.3	—	1.6	19.1
Total ..	87	21.5	256.4	23.2	0.1	4.6	305.8
August, 1960 ..	85	18.3	247.8	21.2	0.1	4.0	291.4
September, 1959	75	20.3	204.2	22.6	1.3	2.7	251.1

TABLE 3.—*Weekly Average Deliveries of New Non-alloy and Alloy Finished Steel.* (*Thousands of Tons.*)

Product.	1958.	1959.	1959. August.	1960. July.	1960. August.*
Non-alloy steel:					
Ingots, blooms, billets, and slabs‡	4.6	5.1	4.7	3.7	4.2
Heavy rails ..	10.2	6.8	4.0	7.3	8.2
Sleepers	1.2	0.6	0.4	0.7	0.6
Fishplates and soleplates ..	0.7	0.4	0.2	0.5	0.5
Plates, 3 mm. thick and over:					
(i) Over ⅜ in. thick ..	29.6	24.8	21.6	18.3	27.6
(ii) Under ⅜ in...	17.7	18.3	17.7	17.3	20.6
Other heavy prods.	41.8	41.2	37.7	42.4	42.0
Ferro-concrete bars	7.6	9.6	8.6	10.7	9.0
Wire rods	21.5	23.5	18.4	20.4	23.5
Arches, etc. ..	8.6	7.8	7.0	6.5	6.6
Other light sections	29.1	33.0	25.9	32.2	31.6
Bright steel bars ..	6.2	7.6	6.4	9.0	7.6
Hot-rolled strip ..	22.6	27.4	19.5	27.4	23.6
Cold-rolled strip ..	7.0	8.0	6.2	8.7	7.6
Sheets, incl. coated:					
(i) Hot rolled ..	10.6	11.8	10.7	11.0	12.0
(ii) Cold reduced	31.1	35.2	32.4	36.4	40.1
Tinplate:					
(i) Hot dipped	8.4	7.7	4.2	7.3	6.3
(ii) Electrolytic	10.3	13.2	6.9	13.8	11.1
Blackplate ..	0.8	0.7	0.3	0.8	0.7
Tubes up to 16 in.	19.0	20.6	16.7	22.4	17.3
Tube, fittings, etc.	0.4	0.4	0.3	0.3	0.3
Tyres, wheels, and axles	4.5	2.4	1.3	2.0	2.2
Forgings(excl. drop)	2.6	2.1	1.7	2.0	1.8
Steel castings ..	4.2	3.6	2.9	3.3	3.7
Tool steel	0.2	0.2	0.2	0.2	0.2
Total	300.5	312.0	255.9	304.6	308.9
Alloy steel	16.1	18.2	14.5	18.3	17.1
Total deliveries from UK prod.† ..	316.6	330.2	270.4	322.9	326.0
Add: Imported finished steel ..	7.0	7.1	5.9	38.9	24.2
	323.6	337.3	276.3	361.8	350.2
Deduct: Intra-industry conversion§ ..	41.2	47.6	36.5	46.0	41.0
Total new material ..	282.4	289.7	239.8	315.8	309.2

† Includes finished steel made from imported ingots and semis.
‡ Other than for conversion into any other form of steel listed.
§ Material for conversion into other products also listed in this table.

TABLE 2.—*Weekly Average Production of Steel Ingots and Castings in September*, 1960. (*Thousands of Tons.*)

District.	Open-hearth. Acid.	Open-hearth. Basic.	Bessemer.	Electric.	All other.	Total. Ingots.	Total. Castings.	Total ingots and castings.
Derbys., Leics., Notts., Northants, and Essex ..	—	4.7	15.5 (basic)	2.9	0.1	21.5	1.7	23.2
Lancs. (excl. N.-W. Coast), Denbighs., Flints, and Ches.	0.9	39.0	—	5.4	0.3	44.2	1.4	44.2
Yorkshire (excl. N.-E. Coast and Sheffield) ..								1.4
Lincolnshire	—	49.7	—	—	0.1	49.7	0.1	49.8
North-East Coast	1.0	94.1	—	1.7	0.4	95.1	2.1	97.2
Scotland	0.8	48.5	—	2.9	—	50.3	1.9	52.2
Staffs., Shrops., Worcs., and Warwicks... ..	—	25.6	—	4.6	0.8	29.0	2.0	31.0
South Wales and Monmouthshire	1.9	91.4	15.6 (basic)	0.9	0.2	109.5	0.5	110.0
Sheffield (incl. small tonnage in Manchester) ..	7.9	41.8	—	14.9	0.4	62.9	2.1	65.0
North-West Coast	0.1	—	6.0 (acid)	0.9	—	6.8	0.2	7.0
Total	12.6	394.8	37.1	34.2	2.3	469.0	12.0	481.0
August, 1960*	9.9	350.3	34.8	26.1	1.8	413.0	9.9	422.9
September, 1959*	14.0	350.5	29.5	30.3	2.1	416.1	10.3	426.4

TABLE 4.—*Iron and Steel Index and General Summary of Pig-iron and Steel Production.* (*Weekly Average in Thousands of Tons.*)

Period.	B.o.T. Price Index, 1938 = 100: Iron and steel.	Coal.	Basic materials§	Iron-ore output.	Imported ore used.	Coke sent to blast-furnaces.	Pig-iron, ferro-alloys prod.	Scrap used in steel prod.	Imports.†	Steel (incl. Alloy). Prod. ingots, castings.	Delivrs. finished steel.	Stocks.‡
1958	343	503	478	276	262	227	245	196	9	369	284	2,242
1959	340	497	477	286	244	210	242	208	7	388	291	2,244
1960—June* ..	338	483	488	297	314	261	295	247	38	466	368	2,311
July ..	339	483	482	302	305	261	289	194	41	391	317	2,427
Aug.*	339	483	476	321	296	255	291	214	32	423	310	2,619
Sept...	339	519	474	336	317	265	306	252	25	481	387	2,637

*Months contain five weeks, all tables. ‡ Stocks, ingots, semi-finished and finished steel, at the end of the years and months shown.
† Weekly average of calendar month. § Used in non-food manufacturing industries.

Scottish NCB's Recruitment Problem

"VERY formidable difficulties" must be overcome by the Scottish Divisional Coal Board if it is to recruit the miners it will need, said Mr. L. R. Milligan, deputy chairman of the division, on Thursday of last week. He was speaking at a meeting of the Lothians branch of the Association of Mining Electrical and Mechanical Engineers.

MR. L. R. MILLIGAN

Even to maintain production at its present level the division would be in the market for about 7,000 to 9,000 men a year. This rate of recruitment, even if a few pits here and there were closed, would be required for as long as they could see into the future. "Can we do it?" he asked, and added: "If the answer is 'yes,' the difficulties are most formidable."

At the time when the decline in the mining industry began in 1958 and well on towards the end of 1959 the wastage rate continued at around 10 per cent. Towards the end of last year and into 1960, however, the rate began to climb alarmingly and, ignoring the effect of the compulsory retirement of older workers, increased by about 4½ per cent.

There were two factors of importance to note. The first was that it seemed to be quite a long time before a realization dawned in the minds of the mining community that the industry was in difficulties, but once this began to filter through despondency grew rapidly. The result was that during most of 1960 men had been leaving the mining industry voluntarily at a rate almost unprecented.

The second was that when the board decided to stabilize its manpower it had an additional 700 new men to recruit for every 1 per cent. rise in the wastage rate, manpower now being around 70,000.

Mr. Milligan emphasized that if the Scottish Division were to maintain its manpower level it had to convince those who were already in the industry that it was far from being in its death throes, and that it had a reasonably bright future, and to convince the public at large, particularly the parents of boys leaving school, that there was a future in the industry, so that it could attract new labour.

Unofficial Strikes Should be Made Illegal

LEGISLATION to make unofficial strikes illegal was favoured by Sir William Scott, chairman of Armstrong Whitworth (Pneumatic Tools), Limited, speaking at King's College, Newcastle-upon-Tyne, recently. Such strikes, he said, had now become a major problem for both industry and the trade union movement.

Strange as it might seem, they usually took place in highly-unionized sections of industry and seemed to occur more frequently in places where high wages were paid.

Bickershaw Miners Break Two Records

MINERS on a coal face at Bickershaw Colliery, Leigh (Lancs), broke two national output records during last week, the North-Western Divisional Coal Board announce.

Just over 100 men working in three shifts on No. 9 East face in the Peacock Seam of No. 3 pit produced a gross weekly output of 9,208 tons. On Thursday, the day's output from the face was 2,522 tons.

Both these figures are national records for output from one coal face. The previous weekly record, of 7,362 tons, was set up in July this year at Barrow Colliery (Yorks).

The Bickershaw face is 285 yds. long and 5 ft.-2 in. thick. The records were set up with the aid of a BJD shearer loader with a combined pre-cutting machine. The machine was developed in the workshops of the No. 2 (Wigan) Area of the division under the direction of the Area general manager, Mr. E. Small, and then tried out on the face for a few months.

Bickershaw Colliery, which is the largest in the Wigan Area, employs more than 2,000 men. It is at present undergoing a large-scale reconstruction scheme, costing about £1,500,000. New underground tunnels are being driven to gain access to large reserves of better quality coal which are still untapped. When completed, in about three years, it is hoped the pit's output will be raised to 4,000 tons a day.

Minister Welcomes National Clean Air Survey

IDEA of a national survey of air pollution was welcomed in principle by Mr. Henry Brooke, Minister of Housing and Local Government, last week. Addressing the Standing Conference of Co-operating Bodies on Air Pollution, he said that he believed that the present co-operative system had grown up over many years in rather a haphazard fashion, as individual local authorities or others became interested in the subject. Quite a number of towns in the black areas and even some large cities did not take any air pollution measurements.

"We have now certainly reached a stage where we need some national standard by which the results of all local measurements can be judged," he said, and added that he hoped that the members of the conference would accept in principle the desirability of having a national survey. The aim of such a survey would be to provide the objective standard needed by which the progress made towards clean air throughout the country could be judged.

ANNOUNCING PLANS to reorganize production facilities, British Ropes, Limited, states that the reallocation of certain production lines will entail the gradual running-down and eventual closure in nine months of the subsidiary, the Edinburgh Ropeline & Sailcloth Company, Limited, Leith. The factory, which has been uneconomic for some time, is one of the oldest in Leith and has been in production for more than 200 years. There will be a staff and works compensation scheme for redundant employees.

Law Cases

NO RATING EXEMPTION

For Institution of Mechanical Engineers

CLAIM by the Institution of Mechanical Engineers to exemption from rating in respect of its headquarters at Birdcage Walk, Westminster, has been dismissed by the House of Lords. The Institution appealed from a judgment of the Court of Appeal reversing a decision of the Lands Tribunal and restoring a decision of the local valuation court that the premises should be entered in the Westminster valuation list at a gross value of £6,000 and a rateable value of £4,997.

Viscount Simonds said the institution claimed to be a society "instituted for the purposes of science . . . exclusively" and that it was "supported wholly or in part by voluntary contributions." Its objects, stated in its charter, were "to promote the development of mechanical engineering and to facilitate the exchange of information and ideas thereon."

Nothing would have been easier than to say that it was instituted for the purpose of science but that was not done. The word "science" appeared only once in the relevant clause and then to indicate the distinction between the "practice" and "science" of engineering in which education was to be given. By its structure, its avowed purpose, and its actual practice, the institution was altogether outside the scope of the exemption.

As to whether the institution was supported by voluntary contributions, Lord Simonds said he did not regard the yardstick adopted by the Lands Tribunal as satisfactory. The question was not whether the value of publications received by members approximated to the amount of their subscriptions, but whether the members received any material benefit from membership. The benefits were largely intangible but where the use of initials indicated not only membership of a professional organization but also the attainment of certain qualifications it was not to be believed that a material benefit was not derived. He would dismiss the appeal. Lords Reid, Radcliffe, Cohen, and Denning agreed.

Winding-up of A.B.C. Coupler Deferred

CREDITORS for £117,500 are opposing a petition for the compulsory winding-up of A.B.C. Coupler & Engineering Company, Limited, Wolverhampton, which was adjourned for a fortnight by Mr. Justice Pennycuick in the Chancery Division. Mr. Ralph Instone, for the petitioner, F. H. Lloyd & Company, Limited, steelfounders and engineers, of Wolverhampton, said the petition was based on the balance of an outstanding judgment debt amounting to more than £17,500.

There had recently been litigation between the controlling shareholders and the directors, as a result of which the company had perhaps omitted to pay its debts. The judge said there would have to be an adjournment. "This is a very substantial company and the advertisement of the petition is incomplete," he said.

Mr. A. C. Sparrow, for the respondent company and for creditors of £116,158, said that he would submit that the petition ought to be dismissed in the light of the opposition.

APPEAL AGAINST the judgment of Mr. Justice Cairns ordering the Upper Forest & Worcester Steel & Tin Plate Works, Limited, to pay £1,333 damages to Mr. William Meecham for injuries sustained at the works, was dismissed in the Court of Appeal. Mr. Meecham's appeal against being held one third to blame was also dismissed.

AGREED DAMAGES of £7,000 were awarded by Mr. Justice Hinchcliffe at Sheffield Assizes to Mr. Thomas Turner (42), a slinger, who sustained severe back injuries in December, 1956, when a heavy steel plate was knocked on top of him. The damages and also judgment for costs was given against the Brightside Foundry & Engineering Company, Limited, Sheffield.

CLAIM FOR DAMAGES against Girlings, Limited, Cwmbran (Mon) brought by a former employee, Mr. Reginald Edwards (60), was dismissed at Monmouthshire Assizes after a four-day hearing. He claimed that he had contracted dermatitis while working at the factory, but Mr. Justice Pearson said that Mr. Edwards's evidence was contradictory and that the company had warned against the risk of contracting the disease and had taken precautions to prevent it.

Transformer Prices

HEARING began in the Restrictive Practices Court on Monday of a reference of the Associated Transformer Manufacturers' Agreement, an agreement between 10 members, Associated Electrical Industries, Limited (Transformer Division), Crompton Parkinson, Limited, English Electric Company, Limited, Ferranti, Limited, Fuller Electric, Limited, General Electric Company, Limited, Hackbridge & Hewittic Electric Company, Limited, Johnson & Phillips, Limited, C. A. Parsons & Company, Limited, and Bruce Peebles & Company, Limited.

The agreement provided among other things for minimum prices for transformers sold for use in the United Kingdom, which the association sought to justify under the Restrictive Trade Practices Act, 1956.

Personal

Mr. HUGH D. BINYON, instrument sales director of the Solartron Electronic Group, Limited, Farnborough (Hants), and Solartron Laboratory Instruments, Limited, Chessington (Surrey), returns on Sunday, after an exploratory sales tour of several weeks' duration in China, Hongkong, and other Far East territory.

Mr. A. R. M. GEDDES has been appointed a part-time members of the UK Atomic Energy Authority for the four-year period from November 21, 1960, to November 20, 1964. He joined the Dunlop Rubber Company, Limited, in 1935 and in 1957 became managing director. He is a member of the grand council of the Federation of British Industries.

Honorary degree of Doctor of Laws of Leeds University is to be conferred on Mr. WILLIAM ERNEST JONES, past president of the National Union of Mineworkers, at a congregation to be held on May 18, 1961. Mr. Jones, who entered mining at the age of 14, was appointed general secretary of the Yorkshire Miners' Association in 1939, and was vice-president of the NUM from 1950 until he became president in 1954. He retired last April.

University of Sheffield has conferred the title of Visiting Professor on Prof. G. C. KUCZYNSKI, Professor of Metallurgy in the University of Notre Dame, Indiana, US, who is visiting the department of refractories technology, and the title of Visiting Lecturer on Dr. T. KUSAKAWA, assistant professor and research fellow of the castings research laboratory, Waseda University, Tokyo, who is visiting the department of metallurgy.

FORMER commercial manager of the English Steel Rolling Mills Corporation, Limited, Mr. Leslie Michael Lonsdale-Cooper, is leaving next month to become general manager of the Pacific Steel Company, Limited, which is setting up a £3,600,000 plant at Auckland, New Zealand. He joined English Steel as a trainee in 1936, completing his training after the war. He spent some time as manager of the special steels department of the Openshaw works while with English Steel.

Sir JOHN GREEN has resigned from the boards of the Staveley Iron & Chemical Company, Limited, Staveley Estates, Limited, and the Sheepbridge Company, Limited. He was appointed to the board in 1955 as nominee of the Iron and Steel Holding and Realization Agency, which recently sold the company to Stewarts and Lloyds, Limited. Sir John is chairman of Thomas Firth & John Brown, Limited, and a director of the new GKN Steel Company, Limited, which has been formed by the amalgamation of the separate steel companies in the Guest Keen & Nettlefolds, Limited, group.

Laporte Stake Titanium Oxide Claim in USA

FORMATION of a joint company to manufacture titanium oxide in the United States is announced jointly by Laporte Industries, Limited, and American Potash & Chemical Corporation, of Los Angeles. The share capital will be divided in the proportion of American Potash 85 per cent. and Laporte 15 per cent.

Technical information and plant design will be supplied by Laporte Titanium, Limited, and initial capacity will be 25,000 tons per annum, at an estimated capital expenditure of $15,000,000. The plant is expected to come into production in the latter part of 1962.

Industrial Relations Director of Scottish NCB

MR. GEORGE McLAREN, deputy industrial relations director, has been appointed industrial relations director of the Scottish Divisional Coal Board in succession to Mr. L. R. Milligan, the new deputy chairman of the Divisional board. He has been deputy industrial relations director, with special responsibility for conditions of employment and wage negotiations, since March, 1955.

MR. GEORGE MCLAREN

Mr. McLaren was born in 1902, and was educated at Rosewell Public School, Midlothian. In 1915 he joined the Lothian Coal Company, Limited, as a surface worker at the age of 13, and he worked as a miner until 1943 with the Shotts Iron Company, Limited, and the Ormiston Coal Company, Limited. He became chairman of the Ormiston branch of the National Union of Mineworkers in 1932 and held this position until his appointment as a conciliation officer with the Ministry of Fuel and Power in 1943. He became Area labour officer of the Central West Area of Scottish Division when the industry was nationalized in 1947.

From 1938 to 1943 Mr. McLaren was a member of the East Lothian County Council.

Offer to Take Over Pulsometer Engineering

APPROACH has been made to the board of Pulsometer Engineering, Limited, pumping and filtering engineers, of Reading (Berks), with a view to the company becoming a member of a larger group. The matter is only at a preliminary stage and no offer has yet been received. The directors state that it is too early to indicate the outcome.

The company is not paying an ordinary interim dividend for 1960. It is estimated that a loss of about £95,000 will be made for the nine months to September 30, 1960. Three of the subsidiaries are earning satisfactory profits of the same order as last year's, but the parent's output is considerably below budget and has not matched the maintained inflow of orders. Further measures have been taken to improve the parent's operations, it is stated, but it is too early to estimate the full effect of these.

FIVE MORE employees of G. & J. Weir, Limited, engineers, of Glasgow, recently completed 40 years' service with the company, and each received a presentation from the chairman, Viscount Weir, last Friday. They were: Mr. Hugh Cameron, estimating department; Mr. John Boyter, cost department; Mr. John Harper, who retired recently from the stores department; Mr. Donald McIntyre, outside works department; and Mr. William McKenzie, transport department.

IRON AND STEEL TRADE

ORE imports are an indication of the pressure now being placed on the blast furnaces for maximum outputs of basic pig-iron for the steelmakers, and although exports of finished steel have decreased slightly, these have been more than counterbalanced by an increase in the home demand. Delivery dates for most steel products, even in the lighter categories, are lengthening, and rolling mills producing structural steel and plate are in most instances booked up for the first quarter of next year.

Pig-iron

Current outputs of pig-iron are maintained at a high level, the major portion of the tonnage produced going to the steelworks. Judging by the present trend in demand, these requirements are likely to continue at present levels for some months to come—especially if the uncertainty in deliveries of scrap continues.

The ironfoundries are able to obtain all the pig-iron they require without difficulty and overall production in all grades is adequate to satisfy the demand.

Ferro-alloys

In general the demand for most items shows little change. There is a fair request for ferro-molybdenum and ferro-vanadium is receiving reasonable attention. Ferro-silicon is well supported and ferro-chrome is active. There is a steady support for calcium silicide, and the limited call on supplies of ferro-sulphide and ferro-phosphorus remains steady.

There is a fair demand for ferro-titanium, while ferro-niobium continues to attract attention.

Semi-finished Steel

It is still the shortage of suitable labour that is preventing the re-rollers from increasing present outputs. There are the orders on hand and the mills have sufficient quantities of mild steel semis to show bigger production figures, but the labour is not available to reach the output levels possible.

Carbon and alloy steel semis show no signs of becoming more plentiful and this is proving a hindrance to the re-rollers struggling to fulfil pressing demands for delivery.

Finished Steel

In spite of the fact that most steelworks are fully booked up well into next year, pressure by consumers does not abate. Orders can still be placed for forward rolling and occasionally for special sizes for early delivery where additional tonnage is required to make up a rolling quantity.

Stockholders are having a busy time so that the steelworks are receiving substantial orders for stock replenishment. The demand for cold reduced sheets has shown signs of slackening off slightly and bright drawn bars (except for carbon and alloy qualities) are fairly easy to obtain.

AS A RESULT of the transfer of the offices of the Telegraph Construction & Maintenance Company, Limited (a member of the BICC group), from Mercury House, Theobald's Road, to 21, Bloomsbury Street, W.C.1, the telephone number and inland telegraphic address are now MUSeum 1600 and "Telcon Phone London," respectively.

Iron-ore Imports

IMPORTS of iron ore and concentrates (except chrome iron ore) and roasted iron pyrites in October, and the totals for the first 10 months of this year and last, are shown in the table below.

From	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Sierra Leone	48,240	592,029	613,372
Canada	460,007	2,190,244	2,966,134
Other Commonwealth countries and Eire	650	20,892	24,389
Sweden	355,273	2,609,278	3,944,894
Norway	18,784	206,969	268,475
France	33,886	357,624	467,120
Portugal	33,362	195,642	322,927
Spain	84,048	391,548	637,158
Algeria	162,297	1,167,576	1,716,626
French West Africa	—	192,494	—
Tunisia	40,930	427,625	595,785
Morocco (excluding Tangier) ..	39,010	321,914	642,652
Liberia	11,100	296,294	415,530
Venezuela	161,679	1,109,065	1,378,462
Brazil	52,626	446,247	502,969
Other foreign countries	90,122	136,594	652,340
TOTAL	1,592,014	10,662,035	15,148,833

W. P. Butterfield—Bradley Arrangement

IN order to rationalize the group structure and make all manufacturing companies direct subsidiaries, W. P. Butterfield, Limited, manufacturers of steel drums and tanks, etc., of Shipley (Yorks), which owns all the £243,200 ordinary capital of Bradley & Company, Limited, galvanized holloware manufacturers, of Bilston (Staffs), a scheme of arrangement has been drawn up concerning the two companies.

Butterfield is to create £1,000,000 5½ per cent. debenture stock, 1977-82, and will allot £107½ new stock for every £100 of old stock held, the existing stock being cancelled. Holders of Bradley's £331,600 5 per cent. debentures will be offered £1 of the new Butterfield debentures for each £1 of stock.

Butterfield will also create 500,000 5½ per cent. cumulative preference £1 shares, half of which will be allotted on a one-for-one basis to holders of Bradley's £250,000 preference, and, in due course, acquire the issued capitals of all Bradley's subsidiaries.

SITE for an additional European factory at Herstal, near Liège, has been acquired by Joseph Lucas, Limited.

Coalfield News

Miners Disliked BBC Television Play

BECAUSE it gave "a totally false impression of mining all the way through," the executive of the National Union of Mineworkers has protested to the producing company and the National Coal Board about "Pay Day," a Sunday night play presented a few weeks ago on BBC television. The NCB has stated that it was in no way connected with the recording of the play and the BBC has stated that it has received no official protest.

After a meeting of the Nottinghamshire Area Council of the NUM, the president, Mr. J. T. Tighe, and the general secretary, Mr. Albert Martin, said that the play showed miners going straight from a public house down the pit and there was never the slightest semblance of discipline or authority shown. There were scenes of fighting underground—which was not allowed—and throughout the play no one of authority appeared to be at the colliery.

ON TUESDAY the Six Bells Colliery Disaster Fund had reached £97,223. Beneficiaries are to be notified of the scale of distribution of the fund which is likely to reach almost £100,000 before the closing date.

THE INQUEST on the 45 miners killed in the Six Bells pit accident has been altered from November 23 to January 18. It is understood that the coroner is waiting for the report of the inquiry into the disaster before holding the inquest.

STANLEY COLLIERY (Derbyshire), scheduled for closing next year, has set up a new record—50.7 cwt.—for output per manshift. The pit is the subject of contention between the NCB and Derbyshire Area of the NUM which is fighting to save the pit.

MINERS, deputies, and the management at Ravensworth Ann Colliery (Co. Durham) have contributed £40 towards a presentation for Mr. Jack Coulson, Mr. Bob Richardson, and Mr. Jack Wharton, who rescued Mr. Ernest Cheetham, a filler, when he was trapped by a fall at the pit.

THE MAUDE PIT, Backworth (Northumberland) is to be closed on December 3. It was originally planned to close the pit earlier this year, but this step was postponed. Of the 61 miners employed underground, 32 are to be transferred to other pits, and 29 will be retained on salvage work.

VERDICT OF ACCIDENTAL DEATH was recorded at the inquest on Mr. Grosvenor Jenkins (54), a safety officer, who was killed when he was struck by a journey of trams at Wyllie Colliery (Mon). It was stated that the accident might have occurred when Mr. Jenkins was examining a leak in a blast pipe and did not hear the trams coming.

PUBLIC APPEAL for funds for the miners' rest home at Porthcawl, has been made by Mr. Gwyn Phillips, chairman of the home's board of management and Monmouthshire public relations officer for the South-Western Divisional Coal Board. Miners already contribute liberally, but the board of management feels the appeal should be wider.

BRASS BAND CONTESTS organized by the Coal Industry Social Welfare Organization, will be held in Blackhall Miners' Welfare Hall, Blackhall Colliery (Co. Durham), on Sunday. Sections "B" and "D" of the Durham Brass Band League will compete. Competitions for Sections "A" and "C" will be held at Mainsforth Miners' Welfare Hall, Ferryhill, on December 11.

FINAL of a new first-aid competition for novices in the No. 5 Area of the Durham Divisional Coal Board held at Kimblesworth Mining Training Centre at the weekend, ended in a draw between Esh Colliery and Brandon Pit House Colliery, each with 299 points. Brancepeth Colliery was third with 277 points and Waterhouses Colliery was fourth with 257½.

SPEAKING at a Blyth by-election meeting, Mr. W. Blyton, Labour MP for Houghton-le-Spring (Co. Durham), said that the Government proposed closing another 240 pits by 1965, many of which were bound to be in the North-east. In the past 144 weeks, he said, 212,000 men and boys had left the industry and many of those leaving were under 31.

ON BEHALF OF miners and officials of Kilnhurst Colliery (Yorks), the manager, Mr. Edward Benson, presented 17-year-old Leslie Uttley with a cheque for £64 and a plaque, and 11-year-old Christine Mason with a gold watch and a plaque for their part in rescuing a seven-year-old boy who had fallen into a water-filled quarry near the pit. Christine tried to save the boy and both were rescued by Uttley.

DECEMBER ISSUE of "Mining Review," the National Coal Board's newsreel, features power stowing and a training mine at Bradford Colliery (Lancs). On the social side of mining communities there is a feature of wild life patrols at Bedlington and an item on two mining motor-cycling enthusiasts competing in the National Road Race meeting at Oulton Park (Ches).

MINERS at Mickley Colliery (Northumberland) decided last week that the men who joined the pit last should be the first to go when the run-down, prior to the closure of the colliery, begins. On Sunday at a meeting with National Coal Board officials they learnt that the first men to leave the pit will get the choice of 88 vacancies at the East and North Walbottle, Prestwick, and Rising Sun collieries. It is expected that further talks will take place to rectify the position.

Notts Tops National Coal Output Record

LESS than a fortnight after breaking the national coal output record with their figures for October, the nine collieries in the No. 6 (Nottingham) Area of the East Midlands Divisional Coal Board last week broke their own record. Output per manshift for everyone of the 12,500 men employed, including surface workers, was 52.3 cwt., twice the national average and the first time any Area has topped the 50 cwt.-mark. Output per manshift for coal-face workers was just over 7 tons.

Five of the nine pits in the Area set up individual saleable output records. They were:—Bestwood (24,484 tons); Linby (22,265 tons); Babbington (17,810 tons); Clifton (11,529 tons); and Gedling (26,357 tons). Overall OMS records were set up by Bestwood (50 cwt.), Linby (82.1 cwt.), Babbington (54.8 cwt.), Clifton (56.9 cwt.), and Gedling (47.1 cwt.). Face OMS records were set up by Linby (241.7 cwt.), Babbington (149.3 cwt.), Hucknall (113.4 cwt.), and Gedling (122.3 cwt.).

Mr. R. Ringham, chairman of the East Midlands Division, said: "We congratulate all those employed in Area 6, management and men, on what must be one of the most remarkable performances ever achieved in any coal-mining area in this country."

THE COAL TRADE

RETAIL coal merchants, fearing transport dislocations should a cold spell arrive, are endeavouring to build up stocks, but in some areas they are also kept busy by a well maintained current consumer demand. Business in industrial coal is steadily gathering momentum, but few difficulties have yet arisen. Exports are expanding, with encouraging prospects of an even more vigorous business in the New Year.

SCOTLAND

Glasgow—Trade in house coal is below expectations, but it is clear that the position could alter dramatically if conditions changed because supplies are scarcer than a year ago. Output from the mines is consistently 30,000 tons or so a week down from last year—equivalent to more than 6,000 tons of round coal—but in the meantime that quantity is not being missed. There is little doubt that consumers are not taking too well to current prices, especially for the top groups, and purchases are being restricted to immediate needs. For the time being merchants' stock is up to last year's standard, offering a substantial cushion to take the first impact of any sudden surge in demand. Among the list of patent fuels "Coalite" retains its popularity although the market for the others has also improved. Anthracite stove nuts are a firm trade, but it is quite possible to obtain supplies at retail level from one or two merchants who have found demand slower to develop than usual. Hard coke nuts and gas coke sales have expanded, but supplies are adequate.

In the industrial sector demand has improved with the seasonal rise in consumption, and trade is quite brisk in some places. Singles clear very promptly, and pearls are meeting a much improved demand. Doubles and trebles move away without difficulty, and washed smalls and untreated dross are being taken up in large quantities by the electricity authorities. Bituminous and low volatile duff are finding satisfactory outlets. Coking smalls are a brisk trade to match the high standard of steel production and metallurgical coke supplies remain comfortable.

Fife and Lothians—Production in both zones keeps steady, and with demand broadening out supply and demand are comfortably balanced. Large coal is clearing well, and good tonnages of doubles are finding their way into the domestic market.

Closure of Colliery to be Kept Under Review

FUTURE of Binley Colliery (Salop) was considered at a meeting between representatives of the West Midlands Divisional Coal Board and the National Union of Mineworkers, the National Association of Colliery Overmen, Deputies, and Shotfirers, and the British Association of Colliery Management at the Divisional headquarters on Tuesday.

In view of the demand for large coal, it was agreed that no immediate decision should be taken on the closure of the colliery. The position will be kept under review after the end of the winter. Every effort will be made by the board and the unions to improve efficiency at the pit and increase output.

Coal Output Increased by Dwindling Manpower

NUMBER of employees on colliery books so far this year has averaged 604,900, compared with the weekly average of 661,700 for the same period of 1959. The average number of faceworkers has fallen by 26,300 on the 1959 figure to 230,900. However, average overall output per manshift for the year has improved from 1.343 tons to 1.393 tons, while faceworkers have pushed up their average output per shift from 3.733 tons to 3.961 tons.

There were 585,300 wage-earners on colliery books on November 12, against 638,500 on November 14, 1959, the numbers engaged at the coal face being 221,100 and 246,400 respectively. Total absenteeism (all workers) in the week ended November 12 was 14.41 per cent., compared with 14.24 per cent. in the week ended November 14, 1959. Output at the face was 4.070 tons and overall 1.429 in the week ended November 12, compared with 3.846 and 1.377 tons in the week ended November 14.

The following tables gives (in tons) the output of saleable mined coal by division in the week ended November 19, and the tonnage lost through all causes (holidays, disputes, and go-slows):—

Division.	Week ended November 19, 1960.		Week ended November 21, 1959.
	Total output.	Tonnage lost.	Total output.
Scottish	352,600	3,800	383,500
Northern (N&C) ..	245,500	200	255,200
Durham	469,000	—	479,100
North-Eastern ..	849,400	7,500	867,000
North-Western ..	262,200	500	284,300
East Midlands ..	905,400	—	916,100
West Midlands ..	282,300	2,200	313,500
South-Western ..	389,900	3,700	423,000
South-Eastern ..	31,100	—	35,000
Great Britain—			
Deep-mined coal..	3,787,800	17,900	3,956,700
Other deep-mined (including licensed mines) ..	39,100	—	58,900
Open-cast coal ..	140,100	—	161,500
TOTAL	3,967,000	17,900	4,177,100

Mr. R. P. WOOD has been appointed deputy regional sales manager of the London and Southern sales region of the National Coal Board, in succession to Mr. R. Elliott, who has recently been appointed regional sales manager. Mr. Wood was head of the house coal section, prior to which he was in the inland branch of the marketing department at NCB headquarters, Hobart House.

Board Changes

New Chairman of Enfield Rolling Mills

FOLLOWING on the death of Lord Verulam, his brother, Mr. John Grimston, who succeeded him, has also succeeded him as chairman of ENFIELD ROLLING MILLS, LIMITED.

LORD VERULAM

The late Lord Verulam had been chairman of the company since 1949 and the present Lord Verulam joined the board and became general manager of the company in 1938. He was appointed managing director in 1953.

Lord VERULAM, who had been MP for the St. Albans Division of Hertfordshire since 1950, is chairman of Enfield Cables, Limited, Enfield Copper Refining Company, Limited, Enfield Rolling Mills (Aluminium), Limited, and Enfield Zinc Products, Limited. He is also chairman of a number of other companies in the Enfield group and of companies in the metal manufacturing and engineering field, including Aston Chain & Hook Company, Limited.

Mr. William Robert Brudenell Foster, who is a director of a number of companies including Enfield Rolling Mills, has been elected vice-chairman.

BLAW KNOX, LIMITED—Rear-Admiral A. J. Tyndale-Biscoe has been elected to the board.

MASSEY-FERGUSON (UNITED KINGDOM), LIMITED—Mr. S. E. Spicer has joined the board.

HARPER ENGINEERING & ELECTRONICS, LIMITED—Mr. H. C. Deeprose has resigned from the board.

BONNINGTON CASTINGS COMPANY, LIMITED—Mr. J. Blackburn, works manager, has been appointed to the board.

SETTLE SPEAKMAN & COMPANY, LIMITED—Mr. T. M. Carroll has been appointed to the board in place of the late Mr. J. Carroll.

TUBE INVESTMENTS, LIMITED—Mr. Robert Atkinson has been appointed managing director of the engineering division as from March 1, 1961.

WELLWORTHY, LIMITED—Mr. Bernard R. Farrow has joined the board of the company, which is a member of the Associated Engineering, Limited, group.

LIGHTFOOT REFRIGERATION COMPANY, LIMITED—Mr. John A. Howie has resigned as managing director.

S. GUITERMAN & COMPANY, LIMITED—Mr. J. Trup and Mr. F. Fripp have joined the board.

NEW MENDIP ENGINEERING, LIMITED—Mr. H. L. Sharp, previously director and general manager, has been appointed managing director of the company, which is a subsidiary of the Dowty Group, Limited.

INTERNATIONAL COMPUTERS & TABULATORS, LIMITED—Pending the appointment of a chairman to succeed the late Sir Cecil Weir, Mr. H. V. Stammers, deputy chairman, has been appointed acting chairman. Mr. C. Mead becomes deputy chairman and Mr. J. Bull managing director.

W. H. ALLEN, SONS & COMPANY, LIMITED—Following the incorporation of William Foster & Company, Limited, and Gwynnes Pumps, Limited, into the group, Mr. William K. G. Allen has been elected a director and appointed chairman of those companies in succession to Mr. Charles V. Armitage, who has retired.

ASSOCIATED ELECTRICAL INDUSTRIES, LIMITED—Mr. Harry West has been appointed a director as from January 1. He is managing director of Associated Electrical Industries (Manchester), Limited, and of AEI-John Thompson Nuclear Energy Company, Limited, and a director of Metropolitan-Vickers-Beyer, Peacock, Limited, and Sunvic Controls, Limited.

TUBE INVESTMENTS, LIMITED—Sir William Strath has been appointed to the board with effect from January 1, 1961. He is at present Permanent Secretary, Ministry of Aviation. He is also to join the board of the British Aluminium Company, Limited, of which he will become managing director. Lord Plowden, chairman and managing director of British Aluminium, will remain chairman of that company, which is a subsidiary (through Reynolds TI Aluminium, Limited), of Tube Investments.

RESEARCH AND CONTROL INSTRUMENTS, LIMITED—Mr. A. S. D. Barrett has been appointed consultant and has joined the board. Prior to setting up in private practice as an industrial consultant at the beginning of this year, Mr. Barrett was technical director of Edwards High Vacuum, Limited. He is a vice-chairman of the Scientific Instrument Research Association, secretary of the International Organization for Vacuum Science and Technology, and a founder member of the Company of Scientific Instrument Makers.

Birfield Acquires American Company

BIRFIELD, LIMITED, has purchased the Bound Brook Oil-Less Bearing Company, Limited, of New Jersey, US, for an undisclosed amount. One of the companies in the Birfield group—Bound Brook Bearing, Limited—had a licence from the American company to manufacture graphited bearings.

With the growth of powder metallurgy techniques, sintered bronze and iron bearings impregnated with lubricating oil were added to the range, still under licence, and the subsidiary has become one of the biggest manufacturers of sintered bearings, filter elements, and engineering parts in the UK.

With the acquisition of the American company Birfield will become the world's largest manufacturer of sintered bearings and parts.

DUPORT'S INTERIM REPORT

PRESENTING the interim report, the board of Duport, Limited, steelmakers and engineers, of Tipton (Staffs), states that the purchase of the Llanelly Steel Company (1907), Limited, from the Iron and Steel Holding and Realisation Agency for £1,750,000 was not completed until after the end of the financial year. When comparing the net assets (£3,026,918) with the purchase price, it must be realized that in recent years the trading results of Llanelly Steel have not been good. After the reorganization the trading potential of the division will be strengthened.

In the absence of unforeseen developments it is expected to be able to make not less than the same total distribution for 1960-61 and it is intended to pay an interim of 3d. per 5s. share on the capital to be increased by a one-for-two scrip issue.

Company News

NEW JOINT VENTURE

Lilleshall and Spartan form Steel Company

FOLLOWING a considerable period of technical co-operation in the field of stainless steel rolling technique, the Lilleshall Company, Limited, structural engineers, steel rollers, etc., of St. George's, near Oakengates (Salop), and Spartan Steel & Alloys, Limited, Birmingham, have agreed to form a joint company in which they are equal partners, to consolidate and extend their interests in steel rolling. The arrangement, Lilleshall states, will ensure the continuity of supply of their full range of rolled steel products to all Lilleshall and Spartan customers.

Lilleshall goes on to state that the new company, which will probably be known as the Steel Company of Shropshire, Limited, will operate as from January 1, 1961, and initially will be concerned solely with orders for hire rolling of stainless and alloy steels.

The mild steel section business will continue to be handled by the Lilleshall Company exactly as at present.

SUNDERLAND SHIPBUILDING DRY DOCKS & ENGINEERING COMPANY, LIMITED—Resolution to increase borrowing powers to the limit of £6,685,972 for the current year has been passed.

WILKES, LIMITED, nut and bolt makers, of Darlaston (Staffs)—Loss of £18,436 (£16,650) was incurred in the year ended July 31, 1960. Arrears on the preference dividend, which was last paid in the year ended July 31, 1958, now total £2,185.

HUNT & MOSCROP, LIMITED, engineers to papermakers, of Middleton (Lancs)—Accounts for the first four months of the current year to June 30, 1961, show a marked increase in average profit over the previous year. Value of orders on hand is also well above average.

NEWTON, CHAMBERS & COMPANY, LIMITED—Offer of 326,000 £1 ordinary shares at 76s. per share by way of rights was taken up by over 98½ per cent. of the shareholders. Shares not accepted by holders or resulting from fractions will be sold in the market for the benefit of the company.

METAL BOX COMPANY OF SOUTH AFRICA, LIMITED—Net trading profit for the half-year to September 30, 1960, was £397,500 (£186,500). The interim dividend is 4 (3) per cent., but it is stated that this is not a positive indication that the total for 1960-61 will be greater than the previous 10 per cent. rate.

F. H. LLOYD & COMPANY, LIMITED, steelfounders and engineers, of Wednesbury (Staffs)—Agreement has been reached for the acquisition of E. C. & J. Keay, Limited, constructional engineers, of Darlaston, from the Keay parent company, N. Hingley & Sons, Limited. The purchase price is £116,000 in cash for all the capital.

SPEAR & JACKSON, LIMITED—Purchase consideration of the offer for the share capital of Brades & Nash Tyzack Industries, Limited, will be satisfied by the issue of 289,480 5s. ordinary shares. The directors of Brades have accepted the offer and recommend it to other holders. If the amalgamation is effected, Mr. S. M. Bartolomé and Mr. G. P. Lockwood, directors of the company, and Mr. W. R. Clayton, joint managing director of the subsidiary, C. T. Skelton & Company, Limited, will join the Brades board, the present directors of which will continue in office.

GAS PURIFICATION & CHEMICAL COMPANY, LIMITED—If earnings do not continue at the high rate at which they have been running during the past year they should still ensure a satisfactory return on capital invested, the chairman, Sir Charles Hughes Hallett, states. Group profit for the year to June 30 was a record £811,034 (£505,336), and the dividend is 35 per cent. (nil).

TRIPLEX FOUNDRIES GROUP, LIMITED—Reporting on trade in the six months ended September 30, the chairman, Mr. W. H. L. Harrison, says that the results reflect the steady progress of the group. The profit, after providing for all contingencies and charges except taxation, is approximately £121,000, and an interim dividend of 5 per cent., less tax, on the ordinary shares, as increased by the rights issue, is recommended.

EXPANDITE, LIMITED, manufacturers of expansion joints and sealing compounds, of London, N.W.10—It is proposed to write up the nominal value of the ordinary shares from 2s. 6d. to 5s. by capitalizing £250,000 of reserves. The directors expect to recommend dividends for the year ending April 1, 1961, on the increased capital of not less than 10 per cent., of which 3½ per cent. will be paid as an interim dividend in January.

J. H. FENNER & COMPANY (HOLDINGS), LIMITED, power transmission engineers, of Hull—Group profit for the year ended August 31, 1960, was £909,223 (£599,936), before tax of £536,000 (£342,966). The ordinary dividend is maintained at 15 per cent. and there is to be a 5 per cent. centenary bonus. Ordinary share holders are to receive scrip issues of 250,000 new 5½ per cent. £1 preference and £500,000 new ordinary in the ratio of one preference for every 12 5s. ordinary shares held and two new ordinary shares for every three held.

DRAKE & GORHAM, LIMITED, manufacturing electrical, mechanical, and hydraulic engineers, of London, S.W.1—A rights issue is to be made to raise £212,500. Ordinary shareholders of November 30 will be offered 500,000 5s. shares at 8s. 6d. each in the proportion of four for each £1 ordinary share held. It is proposed to split the £1 to 5s. shares. The directors consider that group profits for the current year, before tax, should be at least £100,000, in which event the dividend for the year to March 31, 1961, would be 15 per cent. on the increased capital.

The Scrap Markets

No Slackening in Steelworks' Demand

GENERAL demand for steelmaking scrap is keeping scrapyards steadily busy on collecting and processing, but a number of merchants report that some steelworks are reducing their intake, apparently because works stocks are standing high.

In some areas there is a slight revival at cast-iron foundries where more inquiries are being made for scrap. As there are more outlets now available merchants are able to dispose of heavy cast-iron scrap with greater freedom.

Cleveland—Heavy machinery cast iron material and short steel scrap is in big demand and large quantities of baled scrap is passing forward to the blast furnaces. The more hopeful outlook that has developed recently in local consumption of cast-iron scrap continues and there is now more competition for the better grades.

Prices offered have risen as a consequence and about 7s. 6d. a ton more is being paid for medium qualities. Generally the prices range between £11 10s. and £12 10s. a ton and merchants are much happier about the overall position.

Scotland—Although a number of merchants are reporting that there is a slight reduction in their day-to-day business, this has not yet reached undue proportions, and a fair turnover of scrap generally is being recorded. The steelworks continue their demand for regular supplies of both heavy steel and basic qualities, and regular consignments are going forward to all the consuming works.

The output of turnings remains well up to average and no difficulty is experienced in disposing of this grade, providing it is free from bushy material and alloys. Cast-iron borings continue to be produced in fair quantities and the blast furnaces are always willing to accept delivery of this grade.

South Wales—Demand for scrap of the heavier and better grades remains high. In so far as lightweight material is concerned, merchants are, in many cases, finding difficulty in placing their stocks. Steelmakers and ironfounders are proving more choosey in accepting scrap unless it meets with their requirements and the poor quality material finds little or no market.

There is no surplus, however, of the high-grade material, either on the ground at the works or in merchants' yards. Imports are negligible and the quality of the material is not sufficiently high. The market generally is active.

Ore Chartering

NO ore fixtures have been reported from the Mediterranean but a small cargo of about 2,800 tons of potash has been fixed from Barcelona to Leith for November 21/28 at 37s. 6d., f.i.o. Vitoria/Poland reports 48s. 3d. on gross terms for December 10 and there are prospects of working contract business from Brazil to the Continent. Walvis Bay/Ghent paid 51s. f.i.o. for 7,000 tons manganese, December shipment. Other West African charterers are quoting, but business is rather slow to materialize. West Coast India to Poland reports 9,500 tons ore for November/December at 53s. f.i.o. and trimmed, and Marmagoa/South Japan, similar size, at 41s. 6d. with the option of North Japan at 1s. extra, end November, f.i.o. and trimmed basis.

No further bauxite fixtures are reported from Takoradi to the UK, but charterers are apparently still quoting for January. A cargo of 6,500 tons has been fixed from Port Okha to Porta Marghera at 48s. f.i.o. and trimmed for November 15/December 10.

Once again the only fixtures reported from Casablanca are to South China, 8,500 tons and 14,000 tons, both being fixed for November/December at 55s. f.i.o., the latter vessel giving the option of Shanghai at 56s. and North China at 57s. Tampa/Savona reports 8,600 tons for November/December, rated at $5.50 f.i.o.

GKN to Set up Wire-drawing Industry in New Zealand

PRODUCTION in the £1,000,000 wire-drawing industry which is to be set up in New Zealand by Guest, Keen & Nettlefolds, Limited, will start within a year. News of the venture came on Wednesday from Mr. S. J. McDonald, the GKN manager in New Zealand. Speaking in Dunedin, he said that the new industry would save £75,000 a year in oversea exchange and would ensure continuity of supply.

The Government had welcomed the move as a further step in the development of an iron and steel industry for New Zealand, said Mr. McDonald. A wide range of gauges in both bright and galvanized wire would be manufactured.

It was expected that ultimately most of the country's requirements would be supplied from a new factory to be built on land at Otahuhu, near Auckland, already owned by GKN.

Charles Roberts' Loss of £218,400

LOSS of £218,407 was incurred by Charles Roberts & Company, Limited, carriage and wagon builders, of Wakefield (Yorks), in the year ended March 31, 1960, compared with a previous profit of £557,881. In September, the chairman, Mr. Duncan Bailey, stated that investigations, not completed, into a hire-purchase subsidiary, disclosed a substantial loss, probably exceeding £500,000.

No final dividend is to be paid for the year, against 7½ per cent. previously, but 5 per cent., not subject to tax, is to be distributed from surplus on realization of investment and fixed assets.

Volta River Contract Initialled

FINAL agreement between Ghana and the Anglo-US-Canadian consortium Valco, was initialled on Saturday. Valco has agreed to build the aluminium smelter which will be an integral part of the Volta River hydro-electric scheme, at an estimated cost of £57,000,000.

Valco, set up in August, 1959, by Kaiser Industries, of the US, consists of Kaiser, Aluminum Company of Canada, Limited, the Aluminium Company of America, and Olin Mathieson & Reynolds. The British Aluminium Company, Limited, has been invited to join the consortium.

OBITUARY

MR. R. M. ATKINSON

THE death has occurred of Mr. Robert Morton Atkinson, chairman of Sulzer Bros. (London), Limited, mechanical engineers. He was 71. Mr. Atkinson was educated at Oundle and Sheffield University after which he became an engineering pupil with Vickers, Limited. From 1912 to 1916 he was assistant manager at the company's drop-forging plant, being then seconded to the Ministry of Munitions as director of forgings and castings, and later to the Air Ministry as director of materials and supply (Rolls-Royce engines branch). From 1919 to 1924 he was deputy manager of the railways department of Vickers-Armstrongs, Limited.

After some 30 years with the Vickers group, Mr. Atkinson left in 1938 to become managing director of Sulzer Bros. (London), which position he relinquished on his appointment as chairman last June. In 1952 he joined the board of Richardsons, Westgarth & Company, Limited, and its subsidiary, George Clark (Sunderland), Limited. He was a member of the Institution of Mechanical Engineers and of the Institute of Marine Engineers.

MR. S. C. ICKE

ON Wednesday of last week the death occurred of Mr. Stanley Charles Icke, a former chairman and managing director of the Brooke Tool Manufacturing Company, Limited, Birmingham. He was 82 and retired from active business in 1939.

Mr. Icke was born and educated in Birmingham and began his engineering career with Charles Churchill & Company, Limited. Later, shortly before the first world war, he joined the then quite small Brooke Tool Manufacturing Company as a director. He was chairman and managing director of the company on his retirement. He was also a former director of Listers Tools, Limited, Wolverhampton, and Arthur Scrivener, Limited, machine tool manufacturers, of Birmingham.

SIR JOHN THORNYCROFT

WELL-KNOWN figure in the shipbuilding industry throughout the whole of this century, Sir John Thornycroft, died on Monday at the age of 88. He was chairman and governing director of John I. Thornycroft & Company, Limited. The elder son of Sir John I. Thornycroft, FRS, the founder in 1864 of the Thornycroft shipyard, he trained as an engineer and served in all departments of engineering and construction at the company's yard.

His interests were not confined to ships and he was responsible for the production of the Thornycroft steam wagon, the oil engine tractor, and other types of road transport. He had served as president of the Institution of Civil Engineers, the Institution of Naval Architects, the Institution of Mechanical Engineers, and as a member of the Institute of Transport, and was the author of a number of papers read before these institutions.

MR. LEONARD GODBER

MR. LEONARD GODBER, who was made MBE in this year's Birthday Honours, died on Tuesday. Illness had prevented him from attending the investiture at Buckingham Palace. Mr. Godber, who was 52, was a local director and general manager (services) of Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield, and had been with the company for 37 years. When Sir Harold West was appointed managing director in 1941 Mr. Godber joined him as personal assistant and secretary of the local board of directors. Later he became general office manager and had also served as the company's first personnel officer.

From boyhood he had been associated with the Boy Scout movement and had served as county secretary for eight years until 1958. For his outstanding services to the movement he was decorated with Scouting's highest award, the Silver Acorn, and the Medal of Merit.

MR. T. P. W. NORRIS

DEPUTY chairman of George Kent, Limited, industrial instrument and automatic control manufacturers, of Luton, Mr. T. P. W. Norris, died in hospital on Monday following a motoring accident. He was 68.

Before his appointment to the board of George Kent two years ago, Mr. Norris was chief personnel officer of the Vickers, Limited, group, a position he had held since 1945. He was a past president of the Institute of Personnel Management and at one time was with Imperial Chemical Industries, Limited, at Billingham as division labour manager.

Mr. ALBERT WILLIAM VINEY, former director of Peter Brotherhood, Limited, engineers, of Peterborough, has died at the age of 86. He joined the company in 1940 and retired seven years later.

Mr. JAMES SPEIRS, for 40 years the northern area manager of the Hoffman Manufacturing Company, Limited, died on Sunday at the age of 79. He was a pioneer in the application of ball bearings to machinery.

The death took place on Thursday of last week of Mr. V. P. SCHOLES, a Birmingham area representative for the industrial division of S. Smith & Sons (England), Limited. Mr. Scholes, who was 42, was appointed in 1958.

The death has occurred of Mr. LEONARD THOMAS MADDOCKS, chairman of the Phoenix Steel Tube Company, Limited, West Bromwich (Staffs), which he founded in 1930. He was 67. As an honorary adviser

to the Ministry of Supply, he was a member of the study group which went to Europe at the end of the last war to examine the German steel tube industry. During the war he was with the Precision Steel Tube Manufacturers, the body which co-ordinated steel tube output. Mr. Maddocks was also a director of Connaught Engineering Works, Limited, Birmingham, and Senior Economisers, Limited, London, W.C.1.

The death has occurred of Mr. HARRY IBBOTSON at the age of 89. He worked for Newton, Chambers & Company, Limited, for 55 years and was, at the time of his retirement, light castings works manager. He was an authority on foundry practice.

Dr. GERTRUDE LILIAN ELLES, vice-principal of Newnham College, Cambridge, from 1925 to 1936, and a former university lecturer in geology, died last Friday at the age of 88. In 1919 her researches won her the London Geological Society's Murchison medal, hitherto awarded only to men.

The death has occurred of Mr. WILLIAM CHARLES EVANS at the age of 71. During his career in the mines he became manager of a number of collieries in the Western Valley of Monmouthshire, the last being North Celynen, Newbridge. Prior to nationalization he was mining agent for the South Wales Coalite Company, Limited. He retired in 1954.

The death has occurred of Mr. JAMES FISHER, a former Inspector of Mines, at the age of 71. He began work in the mines at the age of 12 with his father at Cardenden. In 1927 he gained his first-class colliery manager's certificate and was for 12 years agent for the Union Collieries, Limited, in Midlothian. He was appointed HM Inspector of Mines on vesting date and held the position until 1956. From then until September of last year he was consultant engineer for Dron & Dickson, Limited, Glasgow.

"TURNKEY" CONTRACTS

EXPORTS must be looked for to an increasing extent by Davy-Ashmore—the merger of the Davy & United Engineering and Power-Gas Corporation groups—which now employs over 7,000 people, states Mr. F. A. Fiennes, managing director, in the Davy-United magazine Anvil.

"We have to get ready to battle for our living in the highly competitive oversea markets of the world," he writes. "We have to equip ourselves to be able to execute comprehensive or 'turnkey' contracts in various fields when required. We felt that the organization necessary to do this would best be founded upon a strong engineering combine whose product ranges were broadly complementary to one another—and that combination is ideally satisfied by the union of Power-Gas with Davy-United."

EQUIPMENT for the project to harness steam from the volcanic hot springs at Wairakei, New Zealand, for the generation of electricity, is to be supplied and erected by Aiton & Company, Limited, Derby. Two contracts have been awarded to the company; one for the supply of piping and equipment worth £578,660 and the other for erection work on the site worth £323,323. The project, which is almost unique, will involve the drilling of 24 boreholes through which the steam will be piped to two new turbo-alternators.

Recent Wills

SHEPPEE, F. H., founder of the Sheppee Motor & Engineering Company, Limited, York £537,599

TENNENT, W. W., for many years a director of Bull's Metal & Marine, Limited, Glasgow £28,448

DAVIES, J. L., staff manager, No. 1 (Swansea Area), South-Western Divisional Coal Board £5,377

VYVYAN-ROBINSON, A. C., formerly a partner in Hansen Bros., shipowners and coal exporters £127,737

PORTER, FRANK, retired mine surface worker of Newbold Verdon, Market Bosworth (Leics) ... £2,213

SAVEKER, T. H., managing director of T. Saveker, Limited, brassfounders, etc., of Birmingham ... £36,908

ADAM, THOMAS, formerly a director of Brigham & Cowan, Limited, shipbuilders, of South Shields ... £199,086

KERR, G. N., chairman of G. N. Kerr (Engineers), Limited, engineers and agents, of Birmingham £13,193

ELLISON, MATTHEW, chief electrical engineer of No. 5 (Mid-west Durham) Area, Durham Divisional Coal Board £3,361

SHERWIN, THOMAS, retired colliery manager, of Llangendeirne, Kidwelly, and formerly of Farnsfield (Notts) £4,930

LANDER, F. B., managing director of W. Lander & Sons, Limited, wire goods manufacturers, of Birmingham £15,522

SHAWCROSS, JOHN (or JACK), managing director of T. Jackson & Company, Limited, galvanizers, of Wolverhampton £24,194

ROBINSON, BERNARD, formerly assistant works manager at the Park Gate Iron & Steel Company, Limited, Rotherham (Yorks) £3,991

JONES, E. P., former ironmaster, of Chester, and son of Ald. J. Jones, founder of the Wolverhampton Corrugated Iron Company, Limited £232,569

CARRINGTON, TOM, chairman and joint managing director of Tom Carrington & Company, Limited, threading tool manufacturers, etc., of West Bromwich (Staffs) £56,491

BOWDEN, SIR HAROLD, president and former chairman and managing director of Raleigh Industries, Limited, and a vice-president of the Federation of British Industries £932,457

WIDDOWSON, J. G., vice-president of the Neepsend Steel & Tool Corporation, Limited, Sheffield, and managing director of Jonas & Colver (Novo), Limited, also of Sheffield £131,066

BAMFORTH, R. W., managing director of R. W. Bamforth & Company, Limited, manufacturers of tubular furniture and tube manipulators, etc., of Sowerby Bridge (Yorks) £23,581

CLARK, M. H., founder of the Thornaby iron and steel merchants, Henderson Clark, Limited, and twice president of the National Federation of Scrap Iron, Steel, and Metal Merchants £36,065

STEPHENSON, SIR JOHN, chairman of the Eastern Gas Board, 1949-59, former president of the Confederation of Shipbuilding and Engineering Unions, and a director of the Wholesale Coke Company, Limited £12,515

YOUNG, S. J., for many years chief engineer at Point of Ayr Colliery (Flintshire), pioneer of methane gas drainage at the colliery, and an active member of the National Association of Colliery Managers £6,017

TICKLE, WILLIAM, founder of William Tickle & Son (Fuel), Limited, coal and coke merchants, of Hampshire and Dorset, founder member of the Southampton Coal Merchants' Association and secretary of the Hampshire Association £14,688

BATES, C. P., well-known mining engineer and consultant, Fellow of the Royal Institute of Chartered Surveyors and the Geological Society, a member of the North Staffordshire branch of the National Association of Colliery Managers, and a director of a number of companies £45,671

INTESTATE

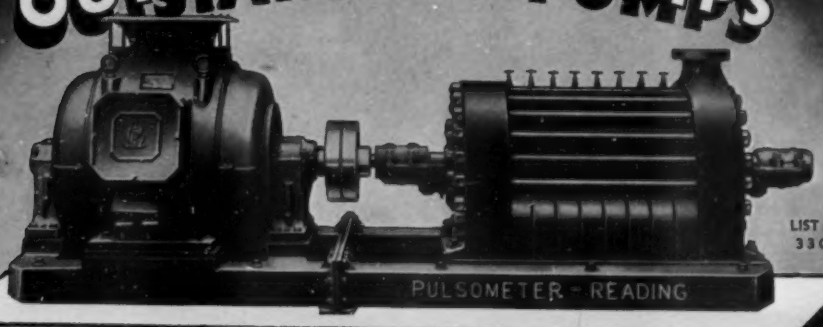
SMITH, T. W., stock control officer of the No. 9 (Neath) Area, South-Western Divisional Coal Board, and formerly secretary to the managing director of the Tareni Colliery Company, Limited £2,245

A PARTY of Italian exfoliators of vermiculite, who recently completed a brief work-study visit on the vermiculite industry of the UK, visited the Balham research development unit of Mandoval, Limited (a company under the management of the Rio Tinto Group), and saw the latest development work being carried out there.

Pulsometer Engineering Co. Ltd.

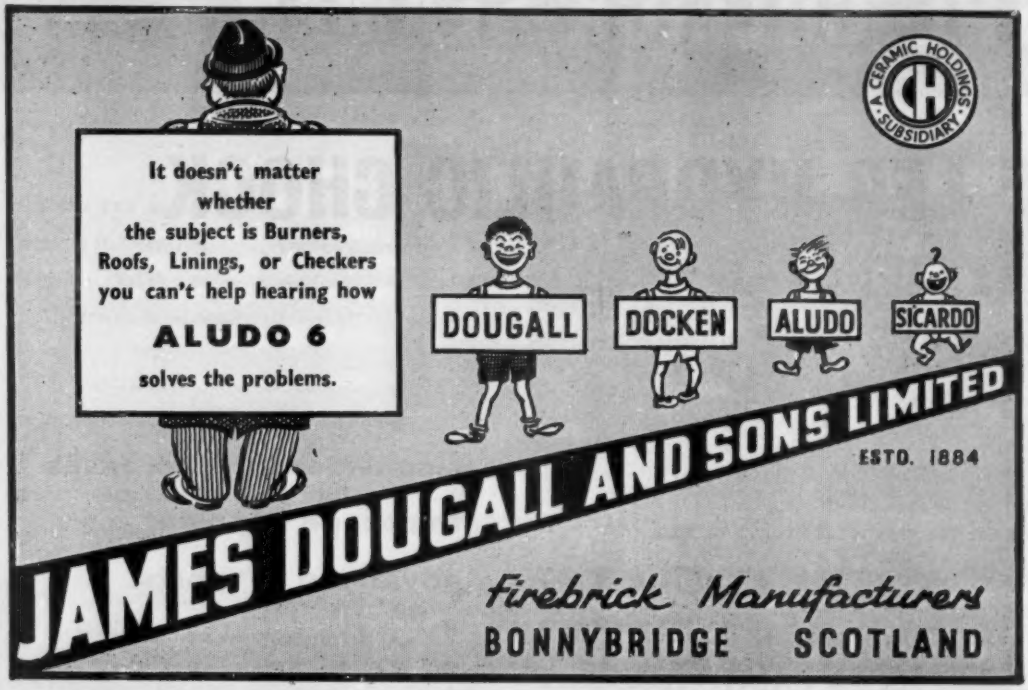
NINE ELMS IRONWORKS READING, BUILDERS OF

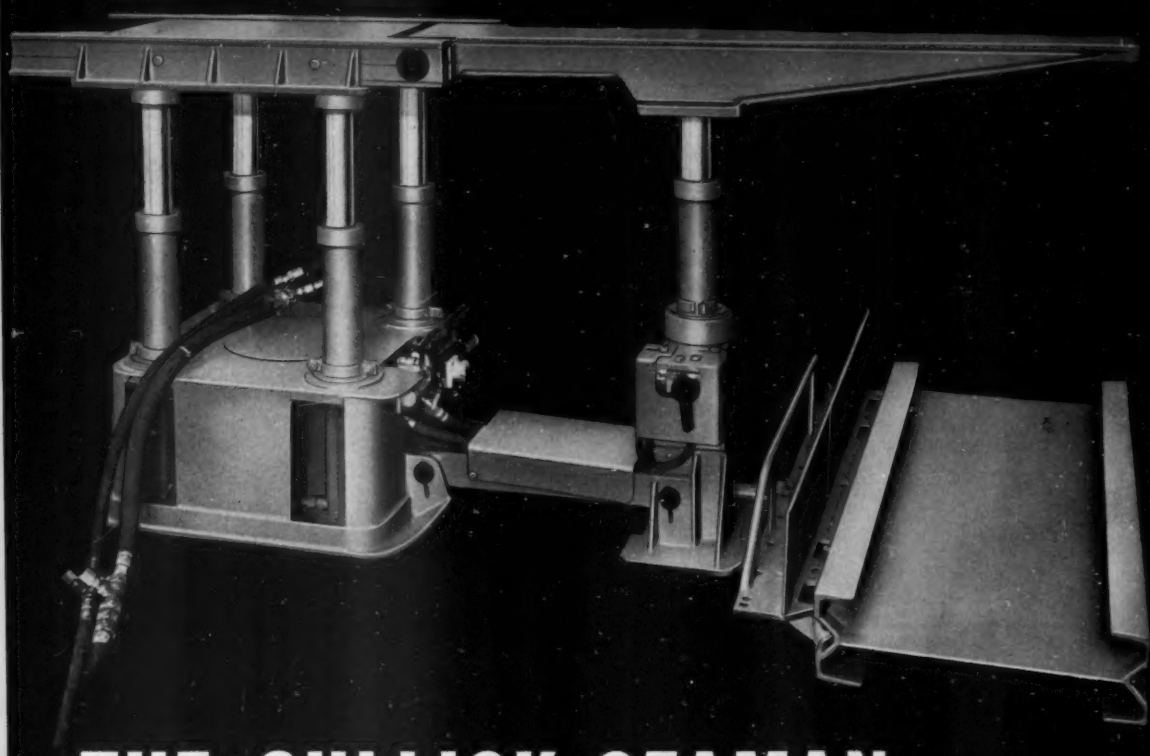
OUTSTANDING PUMPS



FOR ALL DUTIES INCLUDING HIGH LIFT PUMPS FOR MINES
UP TO 3,600 FEET

OFFICES IN: LONDON, BIRMINGHAM, CARDIFF, GLASGOW, LEEDS, MANCHESTER, NEWCASTLE-ON-TYNE





THE GULLICK-SEAMAN

5 LEG HYDRAULIC CHOCK

Strong waste edge support is retained and so good roof control attained; also the valuable safety feature of two rows of support between the operator and the waste edge is retained.

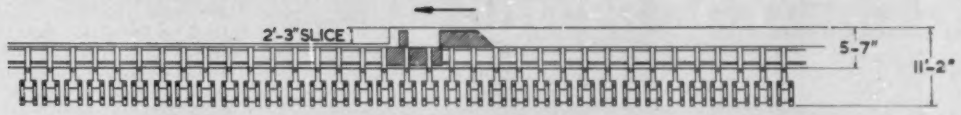
Support close to the conveyor is provided while good bar design ensures a preload to the roof and from the canopy over the conveyor track.

As flexible as 4-legged chocks suitable for seam ranges from 2ft. 10in. to 6ft. 0in.

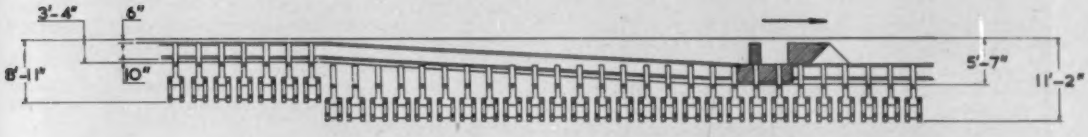
Will work on gradients—special arrangements have been designed for very steep workings.

...considerably increases the scope of power advanced supports.

TYPICAL FACE LAYOUT



FACE DURING CUTTING



FACE WITH MACHINE PLOUGHING BACK

N.B.—Distance of front leg to conveyor varies with type of spill plate used.

Distance of face to conveyor varies with type of power loader used.

This support can be used with all types of power loaders taking depth of coal per machine run up to 30 in.

Chocks can be set at 3ft., 3ft. 6 in. and 4 ft. centres. Where heavy flushing takes place installation at 3 ft. centres is advised.

Under normal conditions chocks can be installed at 3 ft. 6 in. centres. Cost of installation is then only slightly higher than the standard 4 legged chock installation.

Under exceptionally good conditions this chock can be installed at 4 ft. centres.

MODERN
MINING
METHODS

REGISTERED TRADE MARK

GULLICK LIMITED
KIRKLESS STREET · WIGAN
Telephone: WIGAN 46225 (3 lines)

G.23a

News in Brief

ORE IMPORTS at the Hartlepools are expected to reach the record total of 700,000 tons for this year, while for 1961, the target will be 1,000,000 tons.

STEEL PRODUCTION in the United States this week is estimated by the American Iron and Steel Institute at 1,352,000 tons, compared with 1,470,000 tons (revised) last week.

A COMPREHENSIVE PLAN has been introduced enabling commercial and industrial concerns to buy lighting and heating installations from the General Electric Company, Limited, on extended credit terms.

DAVID ROWAN & COMPANY, LIMITED, Glasgow marine engineers, has reached an agreement to manufacture under licence, the new "P" range of marine engines developed by Wm. Doxford & Sons, Limited, Sunderland.

A £20,000 GIANT TRUCK and trailer outfit, described as "the biggest thing that ever left Watford," has has just been shipped to Libya by Scammell Lorries, Limited, for a month-long series of tests and demonstrations.

A SECOND CONSIGNMENT of turf briquettes for shipment to Bristol is being loaded by Bord na Moña in Dublin. A spokesman of the concern stated that there were hopes of building up a big trade in briquettes to England.

THE BOARD OF TRADE has made an order exempting ball or roller bearings of not more than ¼ in. outside diameter from carrying indications of origin under the Merchandise Marks Act. Wrappings containing the bearings must still carry a statement of origin.

IT IS HOPED to organize a Norwegian Week in north-east England in October, 1961. The North East Industrial and Development Association states that the event would be the first practical step in bringing about closer cultural and commercial links between the Scandinavian countries of the European Free Trade Area and the north-east of England.

TWO LONG-SERVICE AWARDS were presented by Mr. W. R. S. Stephenson, joint managing director of Thomas Turton & Sons, Limited, steelmakers, of Sheffield, last Friday. Mr. Wilfred Horace Wade (62) has been 50 years in the firm's steel forge department and is the third generation of his family to work in the department. Mr. Frank Woodhouse (65) has been 47 years in the spiral spring shop.

NIGERIAN ASSOCIATE COMPANY has been formed by Whessoe, Limited, designers and builders of capital plant for the oil, gas, and chemical industries, of Darlington (Co. Durham). The new company, Whessoe Engineering, Limited, will have offices in Lagos and will provide erection and manufacturing services in Nigeria for Whessoe products and also undertake general engineering contracts throughout West Africa.

THE Chloride Electrical Storage Company, Limited, announces that arrangements have been made under which its South African company, whose Exide factory in East London already manufactures a substantial part of the battery requirements of the Union, will shortly take over the production and distribution of batteries now being sold in the Union and nearby territories under the names of Bartleite, Autolite, Prestolite, and USL.

IN ASSOCIATION WITH Kepston, Limited, Kinross, British Furnaces, Limited, Chesterfield, has formed a Kepston division of British Furnaces, for the production of electric resistance furnaces, to operate with controlled atmospheres, including hydrogen, nitrogen, argon, and helium, for heat treatment and brazing operations of most metals and stainless steels.

Scope for Capital Goods in South America

SOUTH AMERICAN countries were embarking on ambitious industrial and agricultural development programmes and their primary requirement was for capital goods, Mr. Frederick Erroll, Minister of State, Board of Trade, said on Monday. He has just returned from a five-week tour of seven South American countries and said that the greatest scope for British exporters there lay in the field of heavy equipment, especially for power stations, railways, roadmaking, and oil pumping and refining.

Total imports into the countries were valued at £1,300,000,000 of which the UK share was 6 per cent. —rather less than current UK exports to Eire. He thought the reason for the failure of UK exporters in South America was their concentration on other markets, the complications of foreign exchange transfers, and the language difficulties.

He reminded exporters of the facilities offered by the UK Chambers of Commerce in each country, from the commercial officers in the embassies, and from the Export Credits Guarantee Department.

"Some Stability" Now in Cable Industry

REFERRING to the cable industry, Mr. A. Parkinson, chairman of Crompton Parkinson, Limited, in his annual review states: "Wasteful and unrealistic competition has now been succeeded by one in which prices for some cable products are still not providing a fair or sufficient return to the manufacturer, but the market in general now has a basis of some stability and under these conditions reasonable profits can once more be attained."

The considerable decline in profits of the cable section of the company's business entirely offset improved trading results shown by other departments both at home and abroad. With a further intensification of competition considered inevitable, diversification of the group's activities will continue to be of great influence in maintaining a steady and even trading performance.

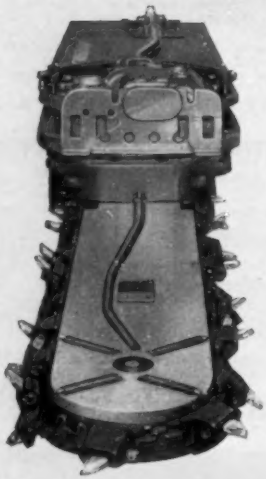
Demarcation and Wage-Claim Policy Needed in Shipbuilding

DISPUTES and strikes in the shipbuilding industry had aroused a great deal of unpleasant publicity and done a great deal of harm to the industry, the vice-president of the Shipbuilding Conference, Mr. A. H. White, told the conference of the British Institute of Management at Harrogate on Thursday of last week. "We have lost orders for new ships and repair contracts because shipowners have doubted our ability to complete the job within specified time limits," he said.

"Managements and trades unions representatives must hammer out a policy which will allow greater flexibility in the employment of our workers. At the same time we might arrive at an understanding which would limit applications for increased wages to long-spaced and stated intervals," he said.

AIDS Muschamp to POWER LOADING

and Production of Large Coal



Muschamp Mushroom Jibs for coal Preparation. Production of large coal without explosives. Coal can be loaded by the use of specially designed flights.

Muschamp Double Jibs. Designed for use with coal cutters mounted on armoured conveyors.

Muschamp Whale Jibs fitted to power loaders suppress dust at the pick point and improve working conditions.

Muschamp's Technical Underground Investigation Service is available at all times.

N. J. MUSCHAMP & CO. LIMITED
Station St., MANSFIELD WOODHOUSE, Notts.
Telephone : Mansfield 2344, 2345 & 5722

Exports of British Coal

DETAILS of British coal exports and bunker coal shipments in October, and the totals for the first 10 months of this year and last, are given below.

	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
Categories.	Tons.	Tons.	Tons.
Anthracite—			
Large	7,211	80,301	64,292
Graded	27,115	213,370	223,752
Cleaned smalls	16,434	77,380	170,290
All other	35,140	297,050	261,518
Small coal (including household)—			
Unscreened	1,223	25,793	16,379
Large	55,895	182,942	479,938
Graded	33,327	212,649	352,521
Cleaned smalls	108,350	332,228	1,051,799
Untreated smalls	111,723	674,231	878,648
Other	11,829	185,464	131,192
Gas coal—			
Unscreened	13,842	114,037	157,212
Large	1,615	2,273	16,030
Graded	26,928	329,607	316,663
All other	3,406	24,015	23,282
Coking coal—			
Cleaned smalls	—	28,087	34,671
Other	6,434	103,019	98,567
TOTAL	460,472	2,782,446	4,276,754
Destinations.			
Canada	4,388	77,700	58,119
Other Commonwealth countries	7,390	9,266	26,737
Eire	102,475	620,840	944,399
Finland	9,433	18,247	69,855
Sweden	15,339	142,929	174,520
Norway	12,129	77,510	103,855
Denmark	110,677	799,543	1,291,385
Western Germany	37,410	170,978	338,365
Netherlands	99,477	294,112	726,563
Belgium	23,004	257,801	160,441
France	14,512	184,472	137,374
Portugal	13,449	28,450	111,087
Italy	7,200	64,476	99,557
Argentina	—	15,737	7
Other foreign countries	3,589	20,385	34,490
Fuel taken on board vessels engaged in the foreign trade (including fishing vessels) for their own use)—			
British flag	12,397	493,242	252,709
Other flags	1,968	40,748	32,879

Exports of Coke and Patent Fuel

THE following table gives figures of exports of coke and manufactured fuels from the United Kingdom during October, and the totals for the first 10 months of this year and last.

Products.	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Gas coke	62,386	502,251	560,700
Hard coke	49,396	258,160	405,482
Breeze	32,428	354,291	346,285
Manufactured fuel	4,591	115,260	82,224
TOTAL	146,801	1,229,962	1,394,691

Increases of Capital

INERTIA SWITCH, LIMITED, electrical and mechanical equipment specialists, etc., of London, W.C.2, increased by £5,000, in £1 ordinary shares, beyond the registered capital of £5,000.

ARMSTRONG TARRY & COMPANY, LIMITED, engineers and merchants, etc., of Liverpool, increased by £30,000, in £1 ordinary shares, beyond the registered capital of £20,000.

YORKSHIRE COPPER WORKS (HOLDINGS), LIMITED, Leeds, increased by £626,172, in £1 5 per cent. cumulative second preference shares, beyond the registered capital of £3,269,399.

W. RICHARDSON & COMPANY, LIMITED, horticultural builders, engineers, etc., of Darlington, increased by £30,000, in £1 preference shares, beyond the registered capital of £100,000.

BERISFORDS, LIMITED, smallware manufacturers and merchants, etc., of Congleton (Ches), increased by £5,000, in £1 ordinary shares, beyond the registered capital of £120,000.

NEALE, WRIGHT & COMPANY, LIMITED, agricultural machinery manufacturers, etc., of Leamington Spa, increased by £9,000, in £1 ordinary shares, beyond the registered capital of £1,000.

E. H. BENTALL & COMPANY, LIMITED, engineers, machinery manufacturers, etc., of Maldon (Essex), increased by £200,000, in 5s. ordinary shares, beyond the registered capital of £300,000.

MIDLAND PNEUMATIC, LIMITED, manufacturers of controls, machines, tools, etc., of Wolverhampton, increased by £2,500, in £1 preference shares, beyond the registered capital of £12,000.

JAMES COUPER & COMPANY, LIMITED, engineers, etc., of Croydon (Surrey), increased by £49,000, in £1 6 per cent. cumulative preference shares, beyond the registered capital of £1,000.

HOVERINGHAM ENGINEERING COMPANY, LIMITED, iron founders, mechanical engineers, etc., of Hoveringham (Notts), increased by £9,000, in £1 ordinary shares, beyond the registered capital of £1,000.

MULTI-SPRING, LIMITED, spring manufacturers, etc., of Mitcham (Surrey), increased by £5,000, in £1 10 per cent. cumulative preferenme shares, beyond the registered capital of £20,000.

FLETCHER HOUSTON & COMPANY, LIMITED, iron, steel, and hardware manufacturers, etc., of Tipton (Staffs), increased by £400,000, in 1s. ordinary shares, beyond the registered capital of £100,000.

R. HARRIS (BRASSFOUNDERS), LIMITED, Birmingham, increased by £5,000, in 4,000 7½ per cent. redeemable preference and 1,000 ordinary shares of £1 each, beyond the registered capital of £10,000.

BURDETTE & COMPANY, LIMITED, electrical and general engineers, etc., of London, S.W.4, increased by £55,000, in £1 7 per cent. redeemable preference shares, beyond the registered capital of £45,000.

BURNETT & ROLFE (HOLDINGS), LIMITED, engineers, etc., of Rochester (Kent), increased by £10,868, in £1 7½ per cent. irredeemable cumulative preference shares, beyond the registered capital of £104,000.

MARKLAND SCOWCROFT, LIMITED, general engineers, etc., of Bromley Cross, near Bolton, increased by £100,000, in 15,000 preference and 85,000 ordinary shares of £1 each, beyond the registered capital of £200,000.

DERITEND STAMPING COMPANY, LIMITED, stampers, piercers and workers in iron, etc., of Blackheath, near Birmingham, increased by £750,000, in 10s. ordinary shares, beyond the registered capital of £750,000.

MILES DRUCE & COMPANY, LIMITED, machinery and metal merchants, etc., of London, W.3, increased by £250,000, in 5s. ordinary shares, beyond the registered capital of £750,000. The 90,000 unclassified shares of £1 each have been divided into 5s. shares.

HOUSING DEVELOPMENT THREATENS COLLIERY

WARNING that the life of Weetslade Colliery (Northumberland) would be shortened if 300 houses were built on a site at a nearby farm was given by Mr. John Thomson, mining estates manager, of the Northern (N&C) Divisional Coal Board, at a public inquiry recently. The housing development would also mean that the colliery would have to be reorganized at a cost of £1,715,000. "The NCB intends to start working one seam under the site in 1972, and a second in 1980," he said.

Mr. W. B. Harris, representing the builders, maintained that there was an urgent need for houses and that the board could still mine some coal by partial extraction if the site was developed.

Continuous performance!

continuous cast rods and tubes

CUT COSTS FOR PHOSPHOR-BRONZE BUSHES AND BEARINGS

Continuous cast phosphor-bronze rods and tubes by the 'BIRSO' technique offer considerable advantages in cost and superior physical properties.

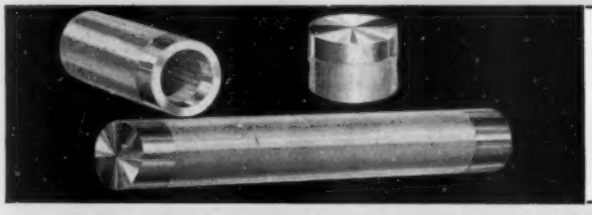
Since the rods and tubes are supplied in exact lengths up to 12ft. there is negligible waste of bar ends.

- No sand core used. ● Porosity is entirely eliminated.
- Greater impact strength, tensile strength, yield stress hardness and better fatigue characteristics, and improved uniformity.

BIRSO TRADE MARK BN

PHONE OR WRITE
for complete specifications of our continuous cast phosphor-bronze rods and tubes together with details of our precision machined bushes and bearings in any quantity.

NON-FERROUS AND HIGH DUTY IRON CASTINGS
FROM A FEW OUNCES TO 10 TONS IN QUANTITY OR ONE-OFF SPECIALS!



CONTINUOUS CAST PHOSPHOR-BRONZE RODS AND TUBES

Round Solid Rod
from ½in dia. to 2½in dia.

Round Cored Rod
from 1in o.d. x ½in i.d.
to 2½in o.d. x 2in i.d.

Minimum wall thickness ¼". All in 12 ft. lengths

T. M. BIRKETT, BILLINGTON & NEWTON, LTD

HANLEY AND LONGPORT · STOKE-ON-TRENT · ENGLAND

Hanley, Phone: Stoke-on-Trent 22184/5/6/7. *Longport, Phone:* Newcastle, Staffs 51433/4.

Imports and Exports of Iron and Steel

FIGURES of imports and exports of iron and steel in October are given in the following tables, based on the Board of Trade returns, and including totals for the first 10 months of 1959 and 1960.

Total Exports of Iron and Steel

Destination.	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Cyprus	97	1,339	1,442
Sierra Leone	1,367	8,543	6,098
Ghana	2,369	22,680	19,014
Nigeria	4,809	64,187	50,468
Union of South Africa	3,942	34,095	54,952
Rhodesia and Nyasaland	2,924	17,724	22,818
Tanganyika	1,546	16,648	12,756
Kenya	1,812	21,413	24,589
Uganda	219	3,513	1,269
Mauritius	58	1,420	4,070
Aden	302	2,708	2,378
Bahrein, Qatar, and Trucial States	1,377	6,557	12,403
Kuwait	327	9,153	5,368
India	12,228	167,192	212,913
Pakistan	3,438	36,354	55,254
Singapore	2,883	18,811	17,611
Malaya	1,248	8,594	15,408
Ceylon	4,120	32,846	43,565
British North Borneo	486	2,269	3,852
Hongkong	5,108	55,360	69,231
Australia	14,547	68,145	149,665
New Zealand	12,588	81,896	102,232
Canada	11,512	175,018	177,191
Jamaica	2,084	18,053	20,054
Trinidad	2,109	34,545	32,847
British Guiana	638	5,473	7,518
Other Commonwealth countries	1,137	29,734	28,141
Eire	5,551	39,883	51,849
Soviet Union	1,147	28,556	24,303
Finland	6,217	30,261	40,426
Sweden	15,008	104,040	145,547
Norway	13,512	77,955	97,673
Denmark	10,540	78,596	82,607
Western Germany	9,565	101,680	116,618
Netherlands	9,248	80,466	100,032
Belgium	2,388	30,948	28,231
France	1,411	5,041	7,099
Switzerland	1,757	7,313	12,049
Portugal	1,304	12,808	13,605
Spain	2,725	23,734	40,299
Italy	3,771	40,048	36,260
Austria	297	3,444	4,304
Yugoslavia	3,263	4,281	32,339
Greece	3,182	9,608	17,052
Turkey	5,956	4,710	17,621
Netherlands Antilles	33	2,955	2,814
Portuguese East Africa	270	1,251	3,806
Egypt	1,949	3,208	11,878
Sudan	830	6,101	8,086
Lebanon	33	3,054	1,700
Israel	1,171	12,312	16,326
Saudi Arabia	6	2,949	375
Iraq	5,272	69,325	37,832
Iran	11,226	32,429	60,102
Burma	160	7,582	4,961
Thailand	466	7,235	5,434
Indonesia	552	5,877	20,502
China	6,191	41,515	45,719
Japan	3,921	144,453	58,363
Philippine Republic	377	6,759	6,427
USA	7,373	159,307	171,355
Cuba	719	6,140	6,624
Colombia	1,283	3,705	7,874
Venezuela	1,645	58,428	30,083
Ecuador	351	848	2,479
Peru	393	2,223	5,321
Chile	323	1,236	3,603
Brazil	490	19,942	23,339
Uruguay	907	1,492	7,585
Argentina	6,991	180,737	72,121
Other foreign countries	10,705	73,733	117,169
TOTAL	255,754	2,482,458	2,752,899

Total Imports of Iron and Steel

From	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Union of South Africa	1,837	22,010	25,641
Rhodesia and Nyasaland	1,483	4,413	6,606
Canada	21,834	15,452	219,708
Other Commonwealth countries and Eire	5,485	9,665	43,411
Soviet Union	—	44,448	27,596
Sweden	5,750	24,953	41,119
Norway	10,242	71,389	129,914
Poland	275	4,162	8,645
Western Germany	5,223	62,882	113,863
Netherlands	14,944	134,626	168,272
Belgium	6,236	19,116	97,900
Luxembourg	1,387	5,536	13,150
France	5,580	18,231	58,090
Italy	258	11,628	21,606
Austria	682	3,476	10,333
Japan	622	2,008	5,939
U.S.A.	11,533	20,739	325,647
Other foreign countries	11,116	9,811	133,271
TOTAL	104,487	484,545	1,450,711
Iron and steel scrap and waste, fit only for the recovery of metal	25,937	2,518	221,171

Exports of Iron and Steel by Product

Product.	Month ended Oct. 31.	Ten months ended October 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Pig-iron	7,355	118,456	128,450
Ferro-columbium (niobium)	4	55	89
Ferro-tungsten	54	1,000	797
Other ferro-alloys	1,126	7,202	9,348
Ingots, blooms, billets, slabs, sheet bars (incl. tinplate bars), and similar primary forms	314	71,573	22,024
Pieces roughly shaped by forging	37	1,342	803
Iron bars, rods, angles, shapes, and sections	118	328	552
Steel bars, rods, angles, sections, and shapes	45,156	405,901	509,256
Iron plates and sheets	1	1,532	528
Universal plates	2,386	7,867	16,993
Steel plate, 3 mm. and under 4·5 mm. thickness	1,744	34,436	32,569
Ditto, 4·5 mm. or more in thickness	30,535	170,799	287,303
Blacksheets and blackplate	26,294	230,953	247,708
Hoop and strip	8,179	69,249	84,600
Tinplate	35,787	388,882	414,431
Decorated tinplate	617	7,278	5,140
Galvanized sheets	6,614	71,939	68,967
Other (incl. tinned sheets, terneplate, and ternesheets)	3,525	18,069	23,354
Railway and tramway construction material	20,847	140,835	144,120
Wire rods of steel (incl. alloy steel)	3,378	41,155	45,665
Wire	10,167	88,855	98,720
Tubes, pipes and fittings	51,516	604,746	611,482
TOTAL	255,754	2,482,458	2,752,899

RISES IN PRODUCTION in the coal and steel industries are reflected in the amount of the freight carried by the north-eastern region of British Railways in the first 10 months of the year. Steel production during October rose by 14 per cent. over the same month of 1959, but rail carryings rose by 16½ per cent. During the six weeks ended October 23, the amount of coal and coke available for transport in the area increased by 2.1 per cent., while coal transport on the railways rose by 8.1 per cent.